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DEVOTED TO THE INTERESTS OF ILLUMINATION, HEATING, MECHANICAL, CHEMICAL AND GENERAL SCIENCE.

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[OFFICIAL NOTICE.]

First Annual Meeting, American Gas Institute.

NEW ALBANY, IND., Aug. 8, 1906.

The first annual meeting of the American Gas Institute, composed of the merger of the Ohio, the American and the Western Gas Associations, will be held in the Auditorium Hotel, Chicago, Oct. 17th, 18th and 19th, 1906, and will be called to order by Mr. B. W. Perkins, President of the Ohio Gas Association, who has been selected as presiding officer. The usual rates on certificate plan of 1½ fare are being arranged for. Due notice of the program and matters pertaining to the meeting of the Institute, will be given in subsequent issues of the JOURNAL, and through the mails.

Yours truly, JAMES W. DUNBAR,
Acting Secretary.

[OFFICIAL NOTICE.]

Wrinkle Department, American Gas Institute.

As former editors of the Wrinkle Department of the Western Gas Association and the Ohio Gas Light Association we are requested to collect a budget of wrinkles for presentation at the first meeting of the American Gas Institute, which will be held in Chicago, Ills., October 16th, 17th and 18th, 1906.

Drawings, photographs, sketches and description of any device, formulæ, or methods for accomplishing objects pertaining to the gas business, are respectfully solicited.

Thanking you in advance for contributing promptly. Yours truly,

W. E. STEINWEDELL, 719 Citizens Building, Cleveland, O.

B. MCADAM, Milwaukee Gas Light Co., Milwaukee, Wis.

[OFFICIAL NOTICE.]

Fourteenth Annual Meeting, Pacific Coast Gas Association.

PROGRAMME.

Officers 1095-06.—John Martin, President; C. O. G. Miller, Vice-President; John A. Britton, Secretary and Treasurer.

Directors.—C. R. Collins, Seattle, Wash.; R. H. Sterling, Watsonville, Cal.; W. F. Boardman, San Francisco, Cal.; Herbert C. Brown, Los Angeles, Cal.

Editors.—Geo. S. Colquhoun, Wrinkles; R. P. Valentine, Experiences; Geo. H. Hollidge, Novelties; Geo. P. Low, Historian.

Librarian.—E. C. Jones.

COMMITTEES.

Committee on Gas Engineers' Degree.—L. P. Lowe, E. C. Jones, John A. Britton.

Committee on Permanent Home.—L. P. Lowe, C. O. G. Miller, Henry C. Keyes.

Advisory Board.—E. C. Jones, C. O. G. Miller, John A. Britton.

Morning Session, 10 A.M. to 12:30 P.M. Afternoon Session, 1:30 P.M. to 5 P.M.

Order of Business, September 18th, 1906.—1. Roll Call. 2. Reading minutes last session. 3. Communications. 4. Report of Secretary and Treasurer. 5. Report of Directors. 6. Report of Special Committees. 7. Report of Library Committee. 8. Balloting on applications for membership. 9. Appointment of Committees. 10. Miscellaneous Business.

After above order of business papers will be read as per list following, but not necessarily in the order in which they are printed.

List of Papers to be Read.

President's Address.

"Should Gas Companies Engage in the Sale of Gas Appliances," W. B. Cline.

"Best Method of Promoting Gas Sales," S. P. Hamilton.

"Experiments with Lampblack in Water Gas Generators," Geo. S. Colquhoun.

"How the San Francisco Gas and Electric Company Supplied 40,000 Consumers After the Fire," S. L. Naphtaly.

"How Electricity was Served to Consumers and Street Car Lines, by the San Francisco Gas and Electric Company After the Fire," L. E. Reynolds.

"Personal Experiences with Municipal Gas Plant," D. O. Druffel.

"The Equity of Sliding Scale Gas Rate," E. C. Jones.

"Experiences with High Pressure Gas Mains," Sherwood Broker.

"Utilization of Gas Engines for Power Purposes," E. C. Lufkin.

"Subject to be Announced," James Goodwin.

"Some Practical Data on High Pressure Gas Compression and Transmission," E. A. Rix.

"The Art of Canvassing," John Clements.

"Novelty," Editor G. H. Hollidge.

LIBRARY OF CONGRESS AUG 17 SMITHSONIAN DEPOSIT

"Wrinkle," Editor Geo. S. Colquhoun.
"Experience," Editor R. P. Valentine.
"Historian," Geo. P. Low.
"The Gas Institute," F. H. Shelton.

Upon completion of reading of papers, the following will be the order of business: 1. Report of Committees. 2. Election of Officers. 3. Unfinished Business. 4. New Business.

Wednesday, September 19th, Banquet. Thursday, September 20th, Outing.

JOHN A. BRITTON, Secretary.

[OFFICIAL NOTICE.]

Second Annual Meeting of the Iowa Gas Association.

OFFICE OF THE SECRETARY,
413 LOCUST STREET,
DES MOINES, IA., Aug. 1, 1906.

To the Members of the Iowa Gas Association—Gentlemen. The Second Annual Meeting of the Iowa Gas Association will be held at the Savery Hotel, Des Moines, Ia., Aug. 23, 24 and 25. The meeting will be called to order at 10 A. M., by the President, Mr. L. L. Kellogg, of Sioux City, Ia. The Savery Hotel will furnish rooms on the European plan from $1 up, and American plan from $2.50 up, according to location. The following papers will be presented to the Association:

"Results Obtained in Iowa from Operation of Ammonical Liquor Plants," by A. T. Averill, Cedar Rapids, Ia.
"New Business and Most Desirable Methods of Securing Same," by Jansen Haines, Des Moines, Ia.
"Liability of Gas Companies in Cases of Asphyxiation," by Geo. McLean, Dubuque, Ia.
"Gasoline Lighting Competition," by H. E. Morton, Ft. Dodge, Ia.
"Why it is Advisable to Educate the People to an Economical Use of Gas," by Austin Burt, Waterloo, Ia.
"Oil Tar as a Dust Layer and Weed Destroyer," by Geo. A. Waring, Omaha, Neb.
"Some Brief Notes on High Pressure," by G. I. Vincent, Des Moines, Ia.
"The Gas House Equipment, its Maintenance and Efficiency," by Geo. Warnking, Muscatine, Ia.

On Thursday evening, August 23, there will be a trolley ride to a neighboring summer resort, returning in time for a theater party at a summer theater. On Friday, August 24, there will be a banquet at the Savery Hotel. The Iowa State Fair opens officially on August 24, and reduced rates on all the roads go into effect on August 23. Members can arrange to take advantage of this rate.

F. W. KELLEY, Secretary.

BRIEFLY TOLD.

CHANGE OF DATE OF THE MICHIGAN MEETING.—Owing to the fact that the hotels in Grand Rapids will be severely taxed during the week of September 12th, 13th and 14th, it has been thought advisable to change the date of the Michigan Gas Association meeting to the 19th, 20th and 21st of September.

NOTES.——

THE St. Louis Gas Construction Company, of St. Louis, Mo., has recently been awarded bench contracts for the following places: Albion, Mich. (2d order), Vincennes, Ind. (2d order), Boise City, Idaho, Sedalia, Mo., Lockport, N. Y., Gainesville, Tex., and Greenfield, Mass.

A GAS franchise is being sought at Fenton, Mich. As presented the franchise runs for 30 years, with the provision that at the end of that time the village must either purchase the plant or extend the franchise for 30 years more. The franchise fixes the price of gas at $1.50 per 1,000 for illuminating and $1.25 for fuel.

A BILL in equity was filed by Attorneys Daniel J. Ferguson and William Wilhelm in the case of P. J. Ferguson, plaintiff, against the Shenandoah (Pa.) Gas Company, Shenandoah Illuminating Company and the Shenandoah Light, Heat and Power Company, defendants, in which it is set forth that the three companies are arranging for a merger and intermingling of their stock to the threatened loss of Ferguson, who holds a large block of stock in the Gas Company, from which he asserts he has received no dividends in the last year. He asks that separate accounts be kept and the merger be annulled and made void as illegal. The bill is made returnable in 30 days.

FAIRVIEW Township, Pa., expects to have a gas plant along the river at and near New Market.

THIRTY-FIVE stokers of the Buffalo (N. Y.) Gas Company struck for $2.50 per day, they were getting $2.25 for 12 hours' work. The Company is making water gas at the Dart street plant for the second time in 8 years. It is quite handy to have a surplus water gas set or two.

[OFFICIAL REPORT—REVISED BY THE SECRETARY—CONTINUED FROM PAGE 279.]

THE TWENTY-NINTH ANNUAL MEETING, WESTERN GAS ASSOCIATION.

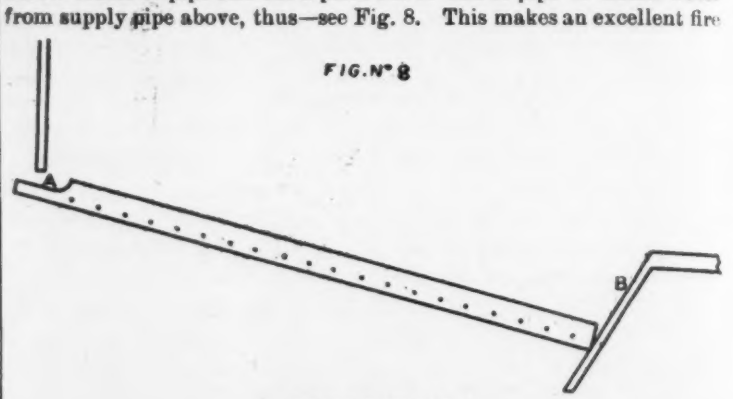
HELD IN CLEVELAND, O., MAY, 16, 17 AND 18, 1906.

THIRD DAY—MORNING SESSION.

WRINKLE DEPARTMENT—*Continued.*

No. 6.—*Fire Bar for Regenerative Furnaces.*—Mr. B. McAdam.—Dear Sir:—Replying to yours of August 1, 1905, "Wrinkle Department." One little device I have introduced with my regenerator furnaces, I have found useful. My grate bars were of angle iron, with a small stream of water running down them. A few hours after the fires were cleaned the angle bars were choked with ashes and water running only a few inches down them, then overflowing.

I had some 2-inch C. I. pipe drilled with two rows of 5 16 holes a little below center of pipe and cut a piece out of end of pipe to admit water from supply pipe above, thus—see Fig. 8. This makes an excellent fire



Wrinkle No. 6.

bar, which does not choke with ashes. The water enters at *A*, runs down the hot pipes and generates steam, which escapes through the nearest holes, then up through the incandescent coke. The end of the pipe is left open and any water that passes through drips on to a C. I. fall plate, *B*, which, being hot, generates more steam. The pipes being round, allows the ashes to fall through better than angle iron, and the increased volume of steam prevents the formation of hard clinkers. —JOHN WITTEN, Gorleston, England.

No. 7.—*The Removal of Naphthaline.*—Mr. B. McAdam, Editor Wrinkle Department, Western Gas Association.—Dear Sir: I beg to acknowledge receipt of your interesting letter of the 1st of August last, which I received just prior to starting on my annual holiday, and since returning to business I have been rather busy or should have replied ere this.

After considering the contents of your letter, the matter which I think might be of most interest to you is in connection with the removal of naphthaline from the gas while being manufactured.

No doubt you will have seen the accounts in our technical press of the Derby, Leicester, and other complicated processes for its removal, but I find the matter can be dealt with in a much simpler manner, and I fear its very simplicity is almost the death of it, as I do not know anyone in this country who works the process as I do. On reading such a trumpet blast which a section of the press gave to the Leicester system, I wrote to the editor of the *Journal of Gas Lighting*, London, explaining my system. See *Journal of Gas Lighting*, October 11, 1904, pages 98 and 99.

I was very much pleased in a letter from an American reader which was published in the *London Journal* on February 7th of this year, page 366, that on your side of the water you were alive to the value of water gas tar for the removal of naphthaline from the gas, as this letter stated that at one or two works in America the naphthaline was being removed by the use of these light tars.

The following is my argument for the absorption of naphthaline from the gas:

For the absorption of naphthaline from gas, use is made of the light tars obtained in the manufacture of carburetted water gas. These tars have a specific gravity of 1.06 and contain between 30 and 40 per cent. of oils in a state suitable for washing out naphthaline.

The system used is to introduce in the top of a Walker's washer about 4 inches (in this case equal to about 120 gallons) of the tar every 24 hours. The washer is placed on the outlet main of the exhauster, and the gas is forced to bubble through this tar immediately before undergoing the ordinary washing and scrubbing process. The tar in the washer is

maintained at a temperature of between 75° and 95° F. In this manner about ¾ of a million feet of gas are dealt with per diem and is found to be of considerable value in removing the naphthaline. Tests made on the washer at various periods during the past 12 months show: Inlet to the washer, 34 grains per 100 cubic feet of gas; outlet of the washer, 11 grains per 100 cubic feet of gas; removing 23 grains of naphthaline from every 100 cubic feet of gas. The main point to be studied is the relief given to consumers and district generally. From August, 1903, to July, 1904, we had in all 1,532 complaints of naphthaline stoppages. This was just prior to the washer being started. Taking the next 12 months after starting—August, 1904, to July, 1905—we had in all 755 cases, showing a remarkable reduction of fully one-half. This I consider very satisfactory on the first year's working, as no doubt there would be a considerable accumulation of naphthaline throughout the district from previous years. I am, therefore, not without hope that next year, through the use of the same process, the complaints will be considerably reduced. Trusting the above may be of interest to you and suitable for your Wrinkle Department, which I think a capital idea, as it must be of much use to the profession at large, and wishing you every success in your endeavors to make it as useful as possible.—ALEX. ALLEN, Scarborough, England.

Dear Sir: I have hesitation to reply to your invitation to send you particulars of anything I have found useful to me, because I felt that I may select something which, born of necessity, is quite original as far as I am concerned, but may have been in regular use for years within a few miles of my works. However, I am sending you two ideas which may not be familiar to all, and at the same time wish you all success in your undertaking, with which I have every sympathy.—Yours truly, F. C. HUMPHREY.

No. 8.—*Temporary Supply while Relaying Mains.*—When a main has to be relaid, it is now necessary, owing to the number of gas engines, cookers, etc., that there should be no cessation of supply, and the plan I have adopted with great success recently is to tap a large hole in the live main, connect a piece of flexible metallic hose, form a rider of wrought iron pipe and connect on to a main, leaving a sufficient section by-passed for the operations of the day. A couple of gas bags make this section dead and operations are commenced on the section, services transferred, a temporary connection made with the old main, and gas supply resumed for the night. The last pipe has two holes drilled in it, one of which may be reduced and used as a standpipe for the night. All is ready for the rider next morning. Should any consumers on the dead section want a supply, an india rubber pipe connection will suffice. Also, should it be impossible, owing to bad weather or other causes, to complete the connection between the old and the new mains, the rider will insure the district from being entirely without gas.—F. C. HUMPHREY, Nottingham, England.

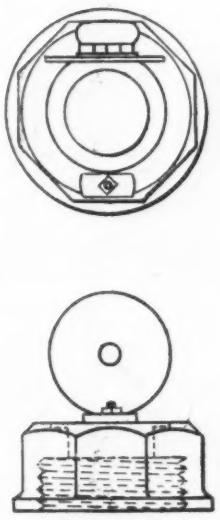
No. 9.—*Slot Meter Rebates.*—As the tendency of all gas supplies is to reduce the price of gas, it is necessary on such occasions to vary the quantity supplied by these machines. Where they number thousands this is no small matter. I have adopted a plan for some years of giving the return when the gas is reduced in coin, and not altering the meter at all. Many customers look on it as a dividend, and all of them like it. I make no return unless the consumption exceeds 2,000 cubic feet per quarter, hence my unprofitable consumers can easily be dealt with. They must either mend their ways or go. I collect all cooker rents from the returns, making no supplementary charge. These latter are unpopular and almost uncollectable. The system has been at work for some time now and is immensely popular.—F. C. HUMPHREY, Nottingham, England.

No. 10.—*Conbination Large and Small—Outlet Cap for Meter Testing.*—Fig. No. 9 is a conbination cap for meter testing, which has hinged on top a disk with a small outlet. To test with a small outlet, the cap is shut down and closed on to a leather gasket, and kept closed by a small catch. To test with an open outlet, it is unnecessary to remove the cap; all that is necessary is to open the hinged disk, allowing a full outlet.—NEW YORK AND RICHMOND GAS COMPANY.

No. 11.—*Connection for Meter Prover Hose to Meter.*—Fig. No. 10 is on the principle of a beer bottle attachment, to be used to connect the hose to the meter when testing. Top end *A* is the female portion of the union of the prover hose, the lower end is the male portion of the meter union, on which is a leather washer, this fits into the barrel of the meter, and is sprung into place as you would on a bottle.—NEW YORK AND RICHMOND GAS COMPANY.

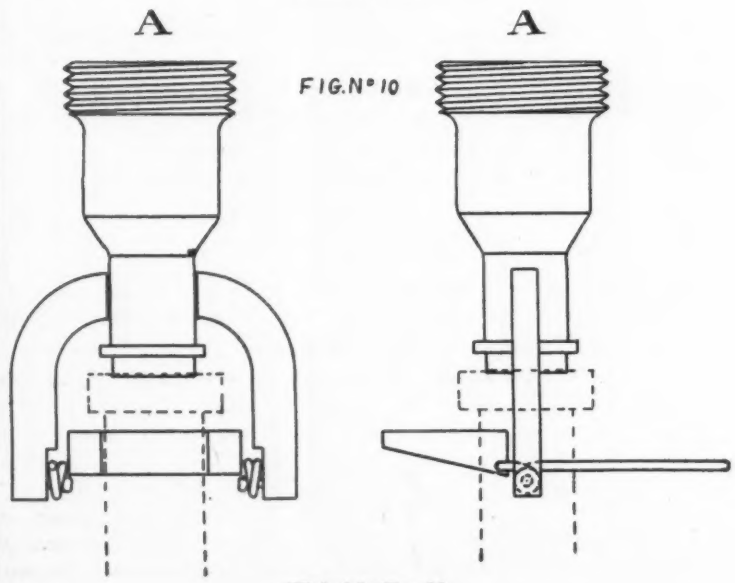
No. 12.—*Meter Record Cards.*—The regular cards have the company number of the meter printed in the proper place in red. The system is on a negative basis, in that the tab with the lowest date indicates that the meter represented by the card has not been tested during that particular year or any subsequent year. The tabs are removed as the meters are tested. For example, if a meter is tested in 1908 the tabs marked 1905, 1906, 1907 and 1908 are clipped off. It follows, therefore, that the gas superintendent or manager can, by glancing along the trays in which the tabs are kept, see in a moment whether his meters are being tested at stated periods. For example, if in 1909 he finds any tabs of the 1905 date he will know that some of his meters have been out 4 years without testing, and can have these particular meters removed. The body of the card is similar to the usual meter record book. The periodical testing of meters is one of the important matters in the gas business that is most neglected, and with the card system outlined there is no excuse for neglect. With them the conditions of 20,000

FIGURE Nº 9

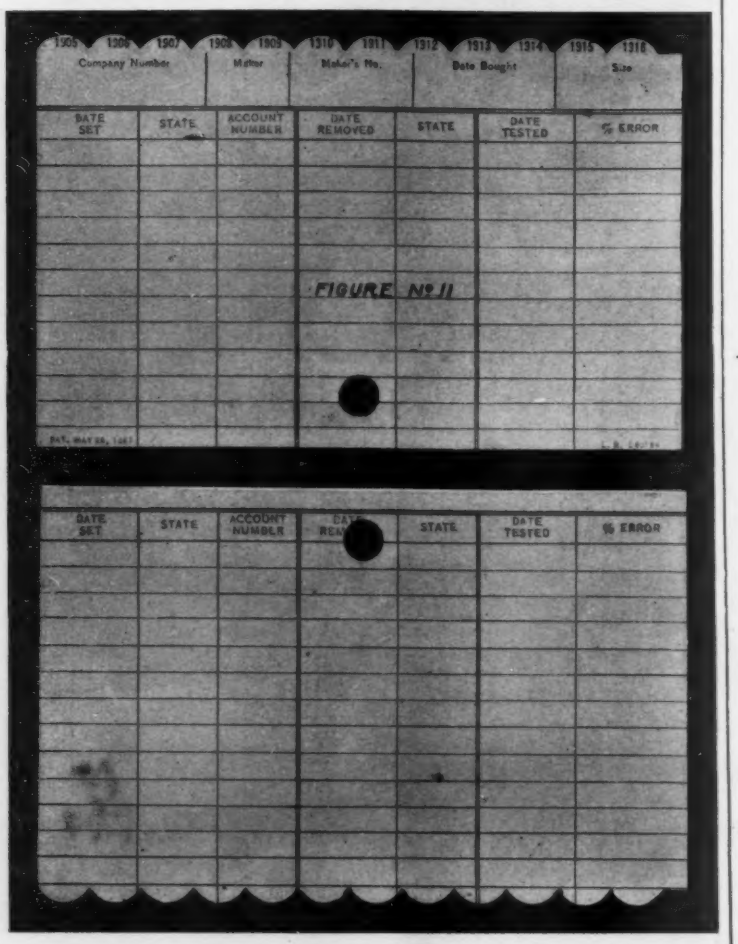


Combination Small and Large Outlet Cap for Meter Testing.

Wrinkle No. 10.



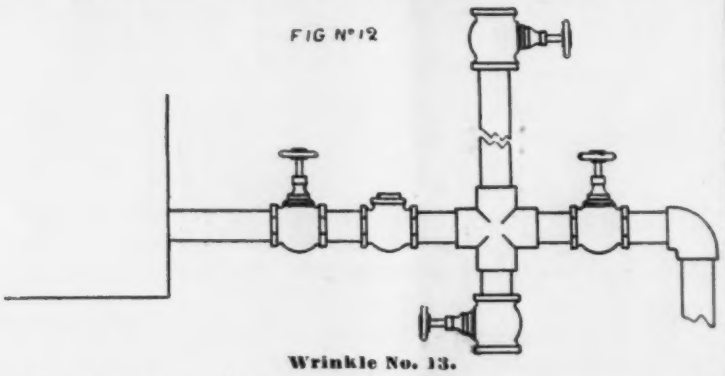
Wrinkle No. 11.



Wrinkle No. 12.

meters can be ascertained by the manager in five minutes, where with the book system as many days would be required. There is no more work involved with the card than with the book system in keeping records. See Fig. No. 11.—R. E. SLADE, Hartford, Conn.

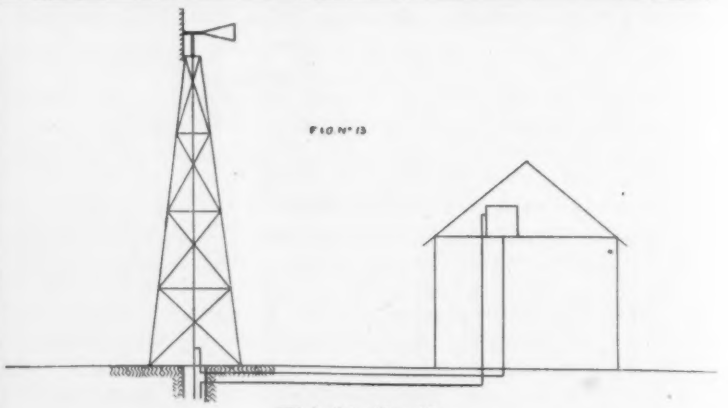
No. 13.—*Arrangement for Putting Compound into Boiler with Ordinary City Water Pressure without the Use of an Injector or Boiler Feed Pump.*—The idea being to empty the water out of the pipe between the 2 horizontal valves. This is done by opening the lower vertical valve; the compound is then put in at the top vertical valve, and on being closed and the 2 horizontal valves opened, the compound will be carried into the boiler. See Fig. No. 12.—R. S. MILLER.



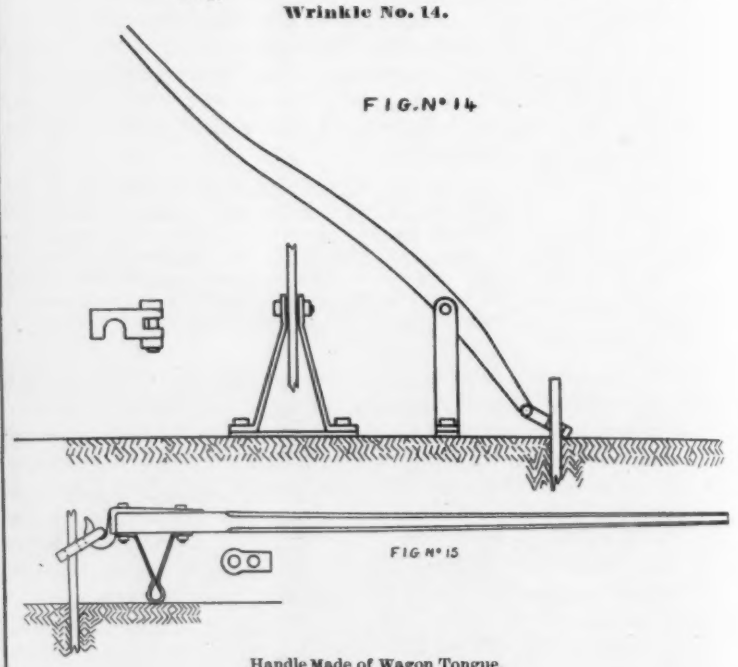
Wrinkle No. 13.

No. 14.—*An Individual Water Supply System for a Small Plant Located Near a Creek or River.*—A small well is dug near the stream and an intake laid to this well from the river. A windmill is then erected over this well and water is continuously pumped to on overhead tank, placed high enough to feed water to the highest point where necessary. The windmill is kept running at all times, and the tank is provided with an overflow to return the water back to the well, producing a steady and uninterrupted supply. See Fig. No. 13.—R. S. MILLER.

No. 15.—*Bar Pulling Device for Locating Leaks.*—The handle is made of any suitable iron, about $\frac{3}{8} \times 2$, which also answers for the stand or rest. You will notice that the stand has two sharpened studbolts to prevent same from slipping when setting the device preparatory to pulling a rod. The toggle is made of forged steel, and the opening which goes around the rod to be pulled will take any sized rod by simply varying the angle at which it is applied. This device, pulls rods from $\frac{1}{4}$ inch to $1\frac{1}{4}$ inch with ease, even in well macadamized streets without in any way disturbing the pavement. See Figure No. 14.—R. S. MILLER.



Wrinkle No. 14.



Handle Made of Wagon Tongue.
Wrinkle No. 15.

No. 16.—*Arrangement for the Removal of Carbon from Retorts.*—The device consists of a double inspirator worked by means of steam, and placed in the lower end of the standpipe, as shown on the drawing. Ordinary scurfing tile are placed in the bottom of the retort, and the mouthpiece is closed with an iron lid carrying the inspirator, connection is made to the steam line by means of a hose. The carbon can be removed and the retort prepared for charging in the time that it would take to carbonize one charge, thus saving a great loss of time which other arrangements require. This arrangement makes it possible to burn out the standpipe at the same time the retort is being scurfed. See Fig. No. 16.—R. B. BROWN, Milwaukee, Wis.

No. 17.—*Method of Handling Outlying Holder to which Gas is Pumped by a Separate Pipe Line, Doing Away with the Necessity of Having the Holder Watched.*—It consists of a weighted butterfly valve, so built that it will close when the holder rises to its highest point. The arrangement consists of a lever having a 100-pound weight at one end and a wire rope connecting with a weight on the butterfly valve at the other end. This lever is placed on the guide frame of the holder in such a position that the holder will lift the 100-pound weight on rising, thus allowing the 50-pound weight to close the valve. A stop is placed beneath the end of the lever bearing the 100-pound weight to take the strain when the holder goes down. This stop must be placed low enough so that the valve may open. By adjusting the throttle on the pumping engine this increased pressure on the pumping line will cause the engine to stop, thereby notifying the engineer in charge that the holder is full. See Fig. No. 17.—R. B. BROWN, Milwaukee, Wis.

No. 18.—*Arrangement for Obtaining Intermittently Direct Water Pressure on Spray of Fresh Water Scrubbers.*—This is done by means

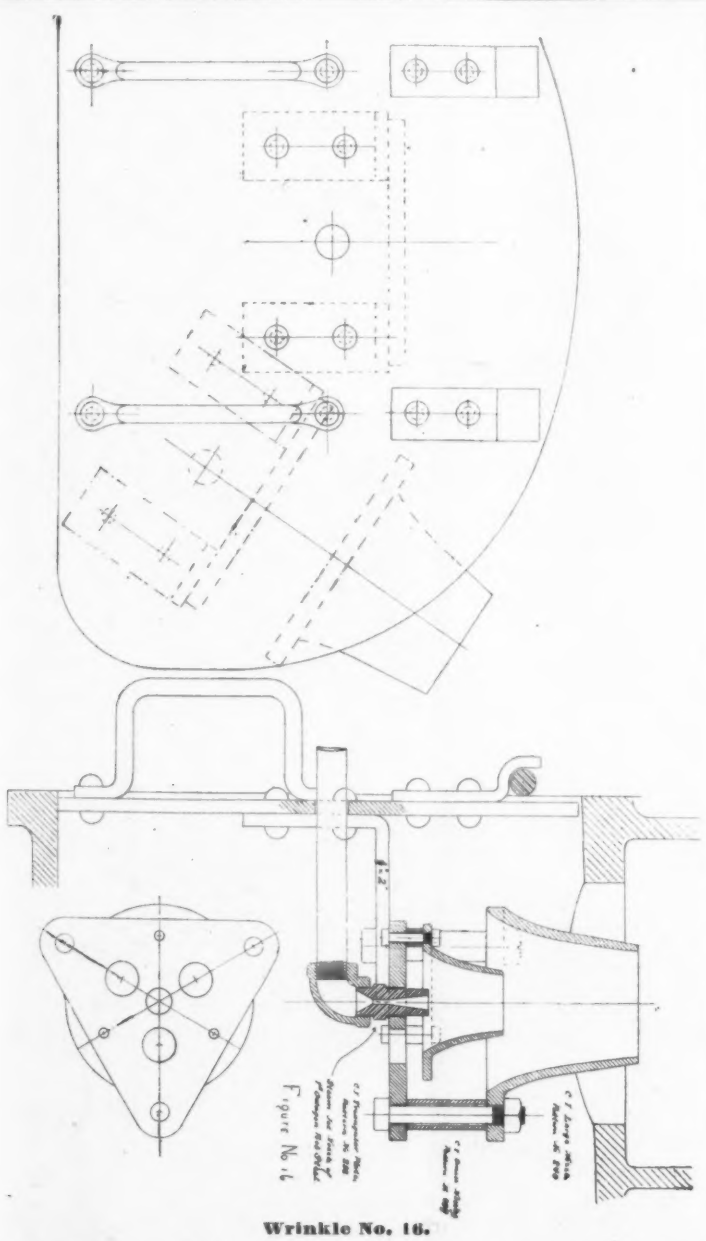


Figure No. 16.

Wrinkle No. 16.

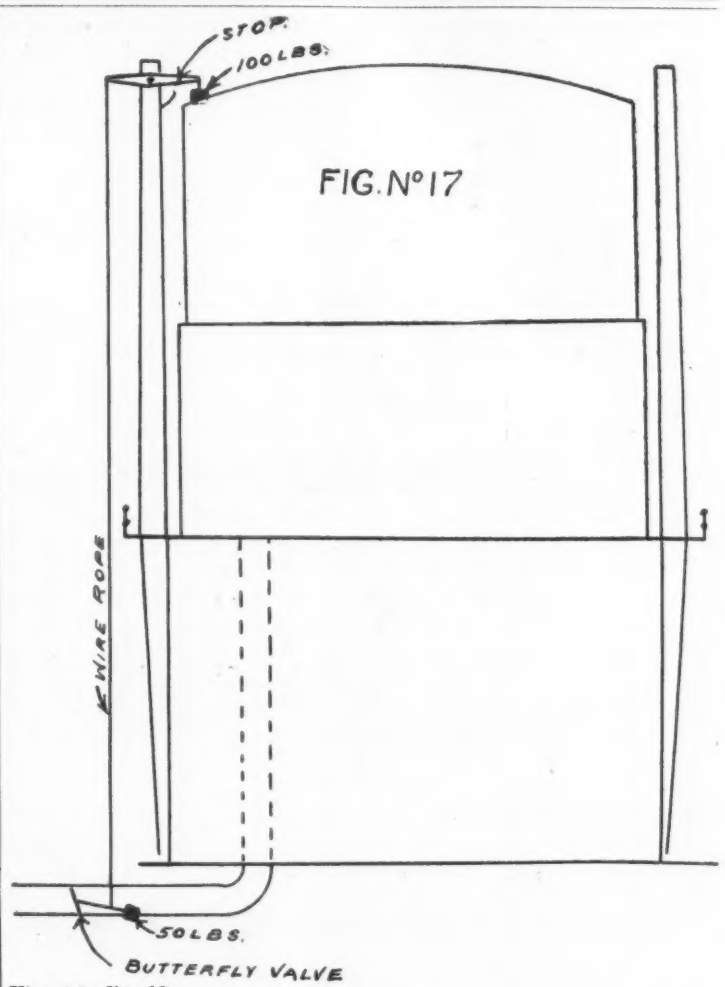
of a small tank in which a ball cock is operated. An independent pipe is used to fill the tank. When the tank is filled to a certain point the water siphons out, allowing the ball to fall and open the cock. This gives the full water pressure on the spray. The point at which the ball cock is closed may be regulated by raising or lowering the ball. This, with speed of filling the tank, determines the time of operation and the amount of water. The waste water may be used in condensers or run to sewer. See Fig. No. 18.—R. C. CORNISH, Milwaukee, Wis.

No. 19.—*Automatic Shut Off.*—It is often desirable to automatically shut off window and outside lights during the evening. This can be accomplished by setting a prepayment meter in the system, and by setting the same at a proper rate can be timed so as to shut off the lights at any hour.—H. DOUGLAS, Ann Arbor, Mich.

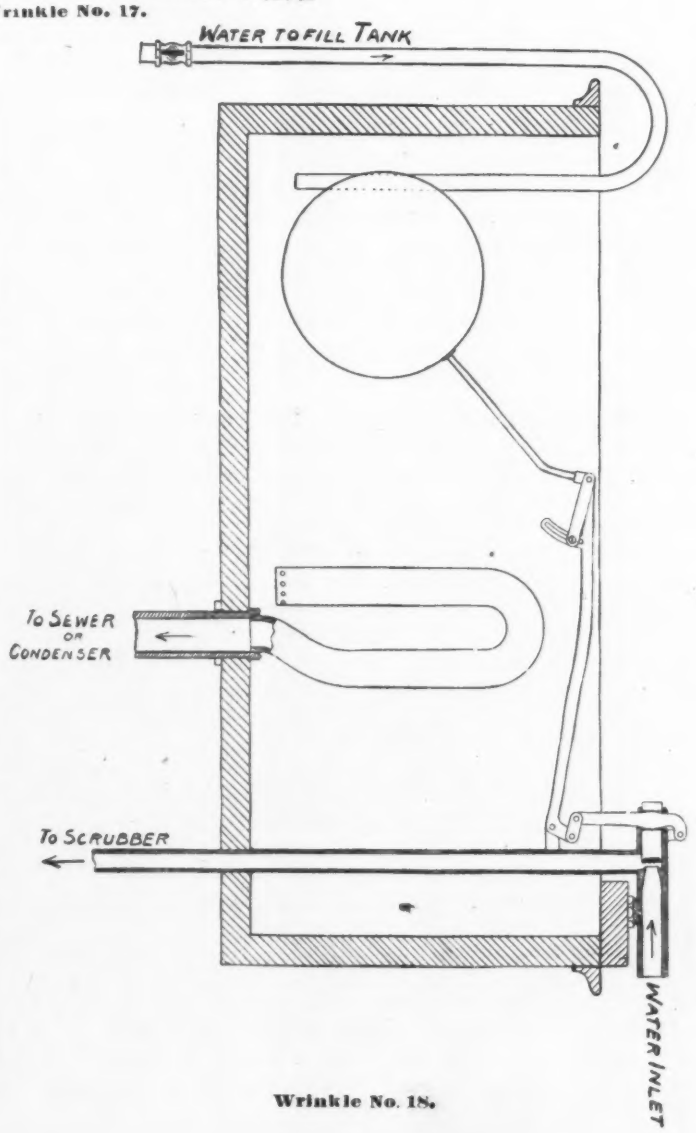
WELLINGBOROUGH GAS WORKS,
Wellingborough, England.

B. MCADAM, ESQ.: Dear Sir—In reply to yours of the 18th ult. I had not forgotten my promise, but I have been so busy that I have not had time to think of anything suitable to send you, and now my difficulty is in knowing what has been already done in the direction of "Wrinkles" by your previous correspondents. I am, however, inclosing a sketch and description of a simple arrangement which we have in use for raising our sewage and spent liquor from the Sulphate of Ammonia Plant, etc., to a higher level for the purpose of getting the same into the town sewers. This is working most successfully, and if it is of any value kindly add it to your wrinkles, but if not, please put it into the waste paper basket. With best wishes for the new year that we have just entered upon, yours truly, JOHN T LEWIS.

No. 20.—*Description of Plant for Raising Sewage from a Low to a High Level Sewer, at New Gas Works, Union Road, Wellingborough.*—The town sewer is about 5 feet above the level of the Gas Company's drainage system. Advantage has been taken of the compressed air plant in connection with West's charging and drawing machinery to

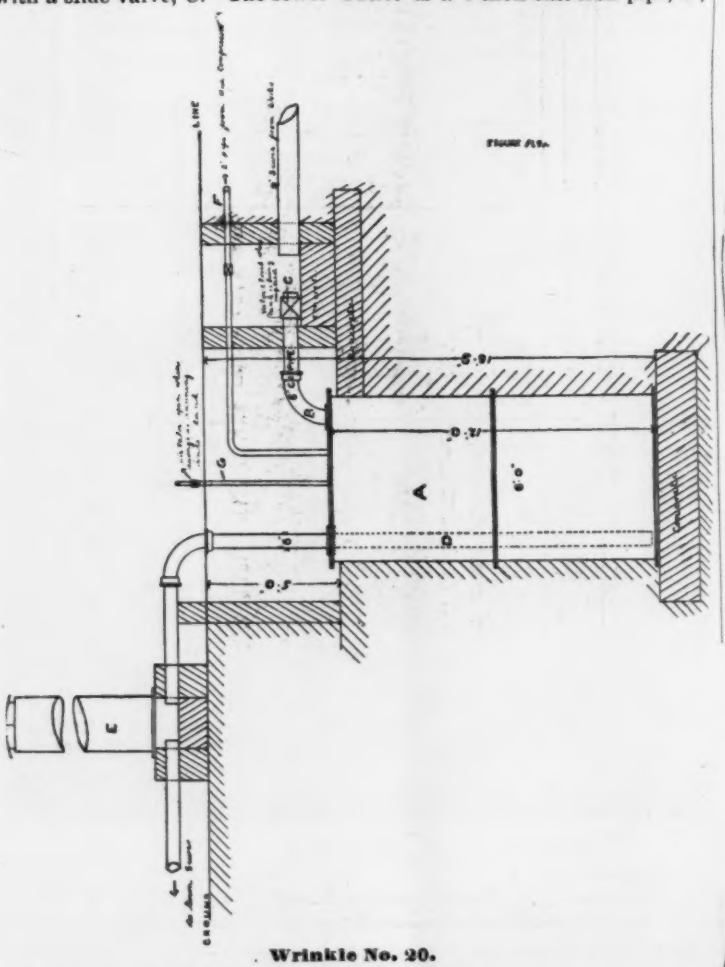


Wrinkle No. 17.



Wrinkle No. 18.

raise the sewage into the town sewers. A cast iron tank, *A*, 6 feet diameeter by 12 feet deep, receives the sewage matter. To this is attached a 6-inch cast iron sewage inlet, pipe *B*, fitted into an inspection chamber with a slide valve, *C*. The sewer outlet is a 6-inch cast iron pipe, *D*,

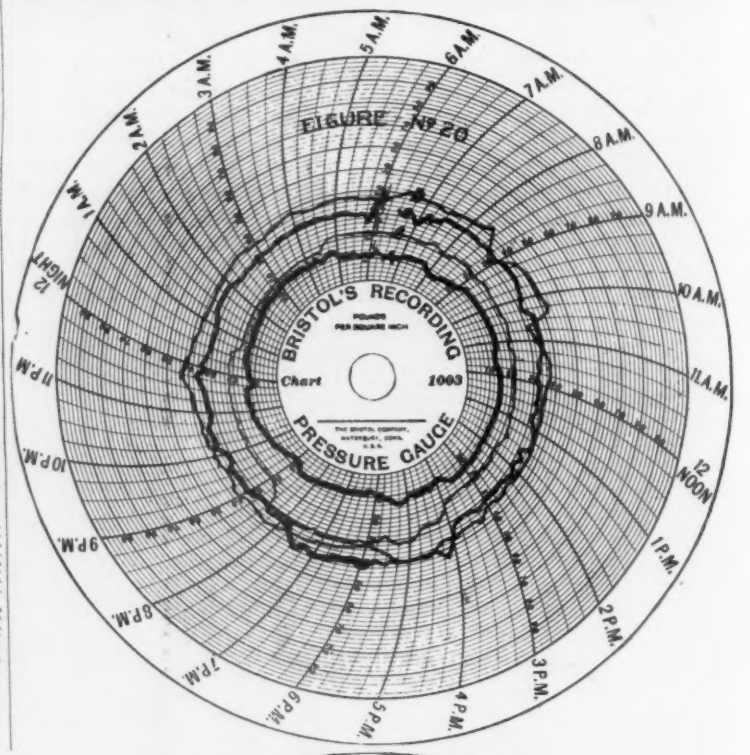


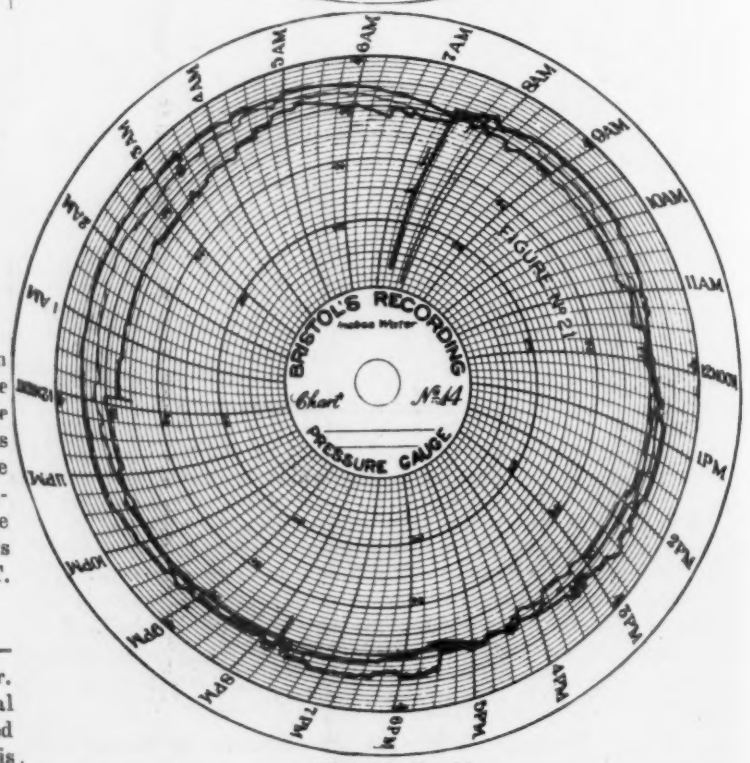
Wrinkle No. 20.

fixed to within 6 inches of the bottom of the tank, *A*. *E* is a relief chamber formed of an old inner boiler tube. *F* is a 1¼-inch air supply pipe with cock from the air receiver. *G* a 1-inch air pipe and valve, to remain open when sewage is running into the tank. When the tank is nearly full, which is shown by bubbles blowing at the air pipe, *G*, the valves. *C* and *G*, are closed and valve on *E* opened, and in a few minutes the tank is emptied of its contents. The air as supplied from the receiver is at 80 pounds pressure, but by means of a reducing valve this is brought down to 40 pounds in the tank. See Fig. No. 19.—J. T. Lewis, Wellingborough, England.

No. 21.—*Using the Same Pressure Chart for More than One Year.*—Figs. Nos. 20 and 21 are two of several charts sent to the editor by Mr. Miller, which are used in New Orleans over and over again for several years, by which means a comparison is shown of the pressures carried during the same day of the different years. A different color of ink is used each year, and the date written or stamped thereon with a corresponding color of ink or pencil. Fig. No. 20 shows the high pressure in the compressor room, the initial pressure under which the gas is sent out. *A* is red ink, used in 1902; *B* is light blue, used in 1903; *C* is yellow, used in 1904, and *D* is dark blue, used in 1905. Fig. 21 is from the Pleasant Street Station, and is from a low pressure main. *A* is blue, used in 1903; *B* is green, used in 1904, and *C* is yellow, used in 1905.—Thos. D. Miller, New Orleans, La.

No. 22.—*A Simple Plan for Plugging Up Abandoned or Old Services.*—It is found necessary at times to abandon services that are under permanent pavements, and for various causes, such as, when a large building is being erected in place of several smaller ones, where one large service is required to replace the existing ones, or where services already abandoned, but connected to the main, are found leaking. To avoid opening the pavement all that is required is to make a few balls of yarn well saturated with cement and ram same into the service with a piece of pipe until about 12 inches of the service is plugged solid at the main. When ells are used on the main no care is needed, and when the service is tapped in the side it is only necessary to cut your rammer long enough to reach within 2 inches of the main. This





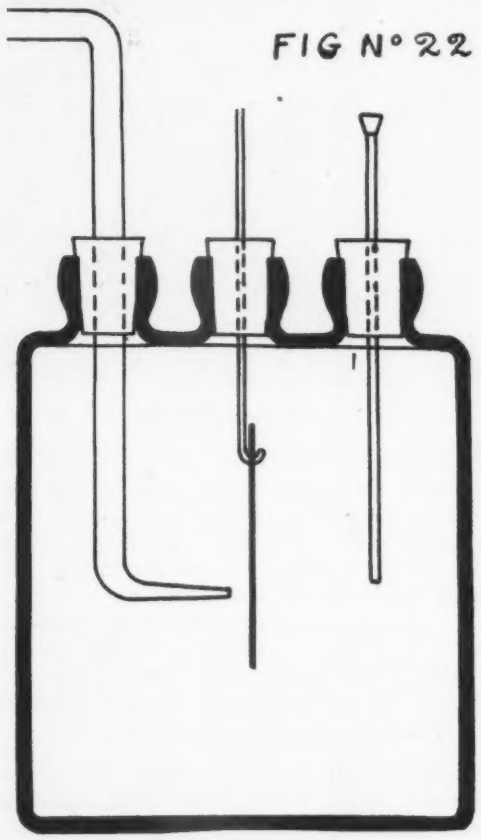
Wrinkle No. 21.

method has been used in Milwaukee successfully for several years.—Milwaukee (Wis.) Gas Light Company.

Chester Gas Works, Chester, England.

B. McAdam, Esq., Editor Wrinkle Department, Western Gas Association—My Dear Sir: First, I must thank you for your exceedingly kind letter of December 18th, which I received on the 29th. Next, permit me to offer you my very hearty good wishes for your happiness and prosperity during the year upon which we have entered. Then I come to the more serious business of the contribution you have invited me to send. Let me say at once that if, when you have read the paper inclosed, you arrive at the same opinion as myself, that it is altogether too feeble and insignificant for notice in your Wrinkle Department, you will be doing me a merciful kindness by relegating it to obscurity, and I shall be eternally obliged to you. I am sorry it has been so long on the road. I am a busy man, and though most of it was written months ago, I have only just been able to complete it. The delay has, however, furnished the result of a trial of the second make of skip. The photos I apologize for; they are taken by one of my boys with a hand camera. If you would like better ones of the skip or screens I will get some taken. I shall be really glad if you will be quite frank, and say whether this is or is not the sort of thing you wanted. With kind regards, John C. Belton.

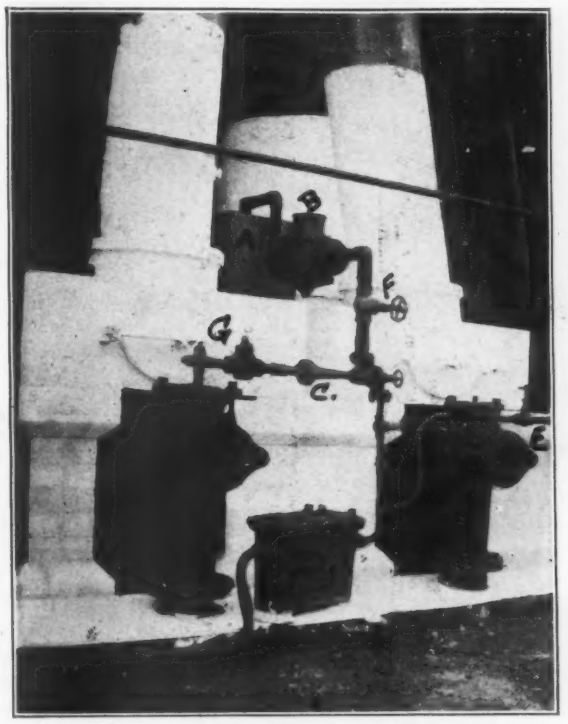
No. 23.—*A Cheap and Handy Sulpher Test Glass.*—This consists of a common Woulf bottle, with 3 necks. Through the rubber cork of 1 of the outside necks is passed a piece of ¼ inch glass tube, having the end which goes inside the bottle bent to a right angle and drawn to a fine point, so as to give a "pinhole" orifice. The other end may be straight or bent to any convenient angle to receive the rubber tube connecting it to a gas cock. The center neck has a copper wire passed through the stopper, the end which hangs in the bottle is hooked to carry a slip of lead paper and adjusted so that the paper hangs square to the glass jet, the third stopper has a piece of $\frac{1}{16}$-inch copper tube passed through it, projecting about 3 inches inside and as long as need



Wrinkle No. 22.

be outside. This is the outlet for the gas, which is ignited at the flattened outer end and kept constantly burning. The paper is changed at a fixed hour daily. This handy test can be rigged up wherever required; incidentally the meter outlet, governor outlet, and the managers's office, are the most useful positions, affording a daily 24-hour test for H_2S, and a constantly ready test for observation *sine die*, a safeguard against the delivery of fouled gas. As illustrating the usefulness of this device it may be mentioned that recently, when the ordinary tests showed perfectly clean at the purifier outlet, the Woulf bottle at the meter outlet showed a distinct stain of H_2S, which investigation proved to arise from a small leak at the center valve in the purifier house. See Fig. No. 22.—JOHN C. BELTON, Chester, England.

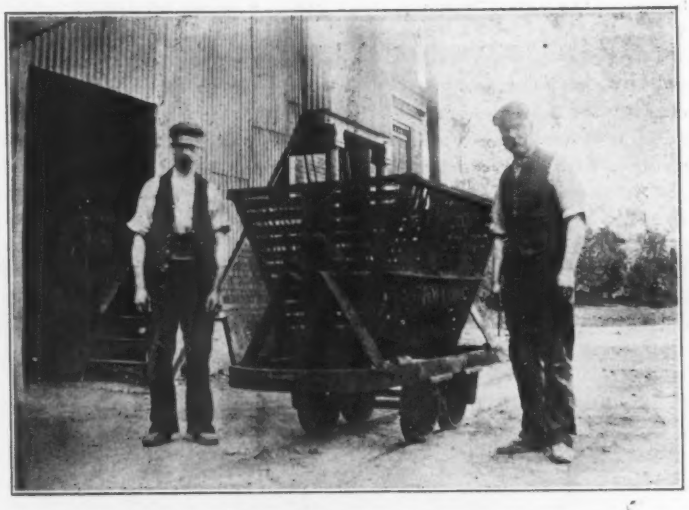
No. 24.—*A Method of Admitting Air to Assist Revivification of Oxide in Situ.*—By this method the air is introduced at the inlet of the condensers; the apparatus consists of a filler box *A*, meter *B*, Körting injector *C*, steam supply *E*, and steam trap *D*, and is used as follows: The outlet of the Körting injector is connected to the tar overflow of the first condenser box (these condensers are of the annular type), steam at a pressure of 50 pounds is admitted at the valve *E*, and the injector and cock *G* opened to allow a small stream of dry steam to pass through. The air cock *F* is then opened and the injector sucks air through the filter and meter and forces it into the condenser. The meter *B* is of the Marsh rotary type, having the index at the top, under a glass bezil. One-minute observations are taken, and the injector is regulated until the required percentage of air (calculated upon the hourly make of gas) is passing. Thus, say it is desired to admit 1.50 per cent. of air, and the make of gas is 28,000 cubic feet per hour, the injector must be regulated until the meter is passing 7 cubic feet per minute. Five minutes' observation daily is all that is necessary if only one official is allowed to deal with the apparatus. The filter *A* is for preventing access of dust to the meter. It is a 12-inch square wooden box, the bottom perforated, the top having only one opening, in which the meter inlet pipe is fixed,



Wrinkle No. 23.

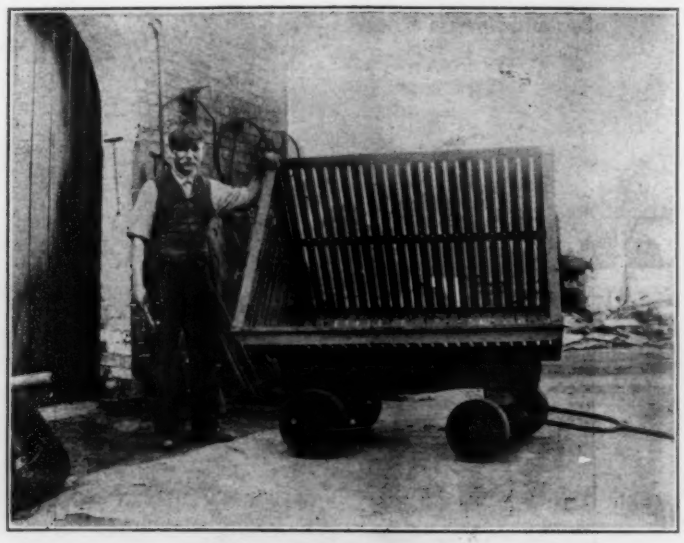
3 trays of perforated zinc overlaid with cotton wool and secured by fillets, form the filter proper. The filter in the photo has been 2 years in use and the cotton wool has been once renewed. The advantage derived from introducing the air with a hot steam blast at this point of the plant is too obvious to need elucidation to gas men. See Fig. No. 23.—JOHN C. BELTON, Chester, England.

No. 25.—*An Improved Hot Coke Skip.*—This is intended to take the place of the solid body skips usually supplied. It will be seen from the photograph that the improved skip is of the open description and is constructed of angles and flats, with strong plates at the ends to which the trunnions are riveted. In practice it was found that the continuous, open U-shaped plate forming the body of the solid skip, buckled and burst from the sudden expansion and contraction of the metal caused by the red hot coke being quenched in the skip. The open-sided skip was first tried with the flat bars secured in the usual manner, *i. e.*, by riveting at the top, center and bottom, but it was soon apparent that sides of this construction buckled badly and also deflected the angle-iron top frame, as shown in Fig. 24. The skip shown in Fig. 25 has



Wrinkle No. 24.

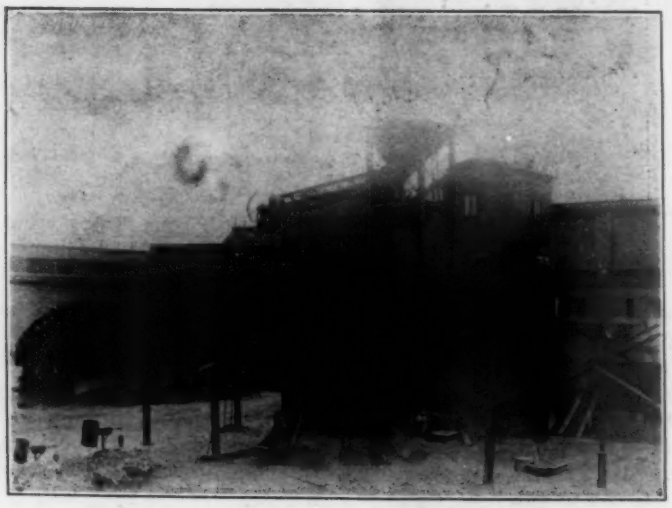
been designed to obviate this defect, which it does very successfully. The top frame is made of $2\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{4}$ inch tee iron, the longitudinal bars having the web turned outwards, and on the inside of these is a $2\frac{1}{2} + \frac{1}{4}$-inch flat kept apart by $\frac{3}{16}$-inch distance pieces; the ends of the vertical flat bars are free between these, and are kept $\frac{1}{4}$ inch apart by distance pieces rivetted through the flat and T-bars. A similar T, $2+2+\frac{1}{4}$ inch, and flat, $2 \times \frac{1}{4}$ inch, from the center stay, and the vertical bars are similarly free in this also. The bottom frame has $2\frac{1}{2} \times 2\frac{1}{2} \times \frac{1}{4}$-inch T and



Wrinkle No. 25.

2½ × ¼ flat, but here the distance pieces are dispensed with and the lower ends of the vertical side bars are rivetted through the T and flat. The vertical flat side bars are thus held at the bottom only and are free to expand and contract through the guiding spaces in the center and top frame, and buckling is entirely obviated. In Fig. 25 the vertical bars are riveted at the center and free above and below, but it was found that the grit and water settled in the bottom spaces and held the bars fast, so that after a time buckling took place between the middle and bottom bars, and this method of construction was abandoned for that described above.—JOHN C. BELTON, Chester, England.

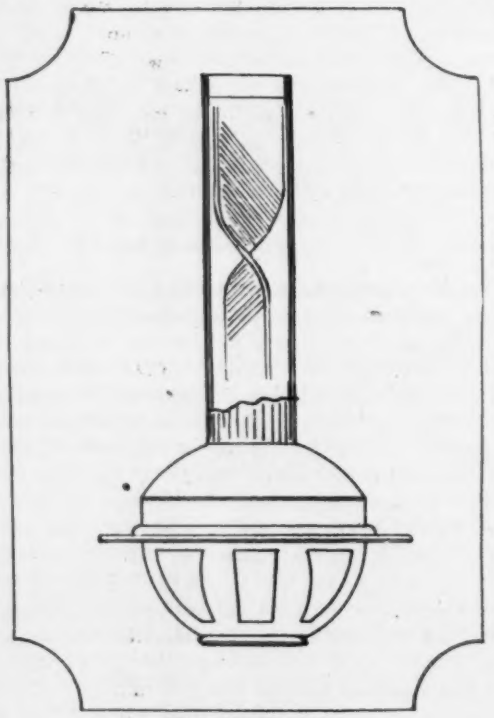
No. 26.—*A Removable Screen for Separating Pea Breeze from Coke Dust.*—Fig. No. 26 shows an elevated Gantry and Loco crane for dealing with the coke as it is brought in trolley skips from the retort houses. The crane lifts the skips and empties them either on to the coke stack or into the hopper of the revolving screen above the store hoppers. This screen sorts the coke into three sizes; the first (and longest) section has ½-inch circular perforations, which take out the dust and pea breeze; the second has ¼-inch perforations, and the pieces which fall through this are readily saleable as broken coke for household purposes, stoves, greenhouse fires, etc. Since the screen has been in operation the coke breaking machine has only been required when the demand was heavy and the stock low. The separation of the breeze and broken coke in the shoots below the screen is marked by the inclined line of the timber at the side of the shoot; at the bottom a strong wooden vertical partition, reaching from the ground to the shoots and extended a few feet at right angles to the screen, keeping the heaps of material separated. At these works Meldrum boiler furnaces are in use, and the fine screenings from the first section were found to be quite good enough fuel for these without any assistance in the way of coal, coke or slack. But a market opening for pea breeze in sufficient quantity to pay for separation, the additional screen, shown in Fig. 27, was devised. This screen is constructed with 3-inch square timber framing and 1-inch sideboards: there are 3 cross pieces which have to carry the bars. The latter are 1¼-inch flats on edge, kept ¼ inch apart by wooden distance pieces; bars and



Wrinkle No. 26.

distance pieces are perforated for ¼-inch round iron tie rod, which is tightened up by double nuts outside the frame. The screen is hung by hooks and eyes to the bottom of the vertical shoot so as to fit close against the partition; the lower end is carried by hooks, slipped over the lower sheet of the gantry. When the screen is thus placed the breeze from the rotary screen above falls upon it, the fine coke dust passes through and is taken away to the boilers, while the pea breeze is shot forward under the gantry, ready for loading into customers' carts. When pea breeze is not in demand the lower end of this screen is released and it is allowed to hang vertically against the partition until again required.—JOHN C. BELTON, Chester, England.

No. 27.—*To Prevent Firing Back in Bunsen Burners.*—The arrangement is designed to use on Welsbach and other Bunsen burners where used without a mantle for heating purposes only, such as for heating wax for sealing packages, heating the ends of fine wires in candy factories and for similar purposes. It is used to prevent firing back in the mixer as commonly occurs, and consists of the following: A piece of

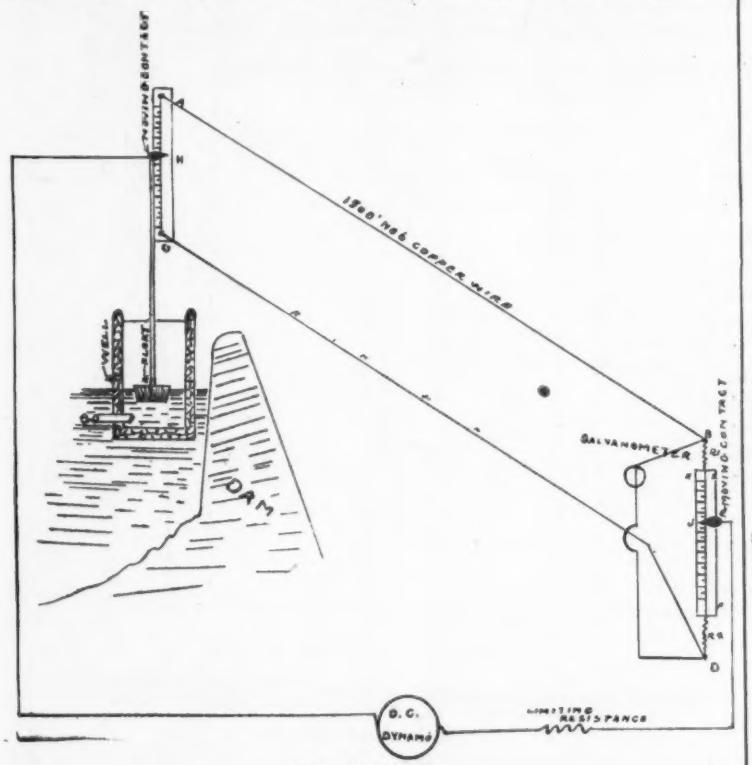


Wrinkle No. 27.

brass plate, about No. 16 gauge, 2 inches long, the width fitting closely to the inner diameter of the Bunsen tube. This plate is given one

complete twist, thereby giving a spiral effect. In firing back, the force of the explosion is lost in making the turn on the plate, and the flame will not follow the tube to the Bunsen. See Fig. No. 28.—JAMES H. WALKER, Milwaukee, Wis.

No. 28.—*A Device for Reading Gauges Located at a Distance.*—The device consists essentially of two slide wire Wheatstone bridges, divided to correspond with gauge readings, corresponding ends being connected by wires of comparatively low resistance, while the two sliding contacts are also connected by a wire in which is inserted a battery, dynamo or other source of current. As this is a zero method, errors due to changes in voltage, temperature or contact of the moving parts are practically eliminated, which are sources of considerable error in other forms of apparatus for this purpose, and as only three wires are required, the cost is not great. For long distances high resistance rheostats should be used and a smaller amount of current. The device will register a change of $\frac{5}{16}$ of an inch very accurately on one ampere; for greater accuracy more current should be used. This arrangement

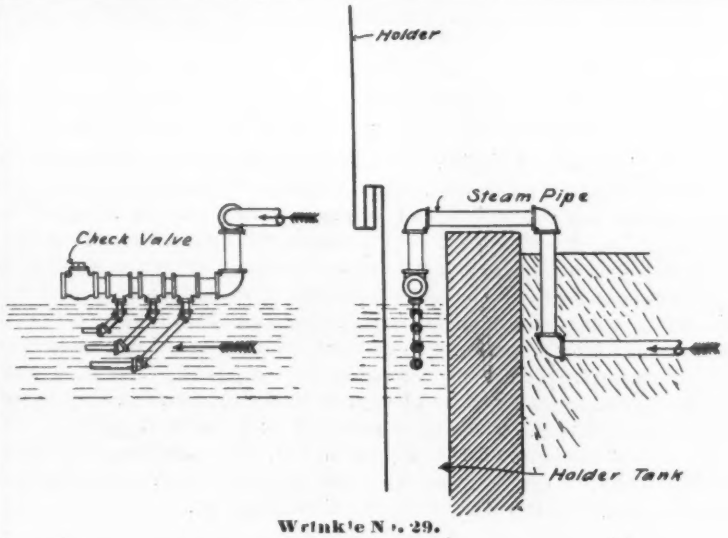


Wrinkle No. 28.

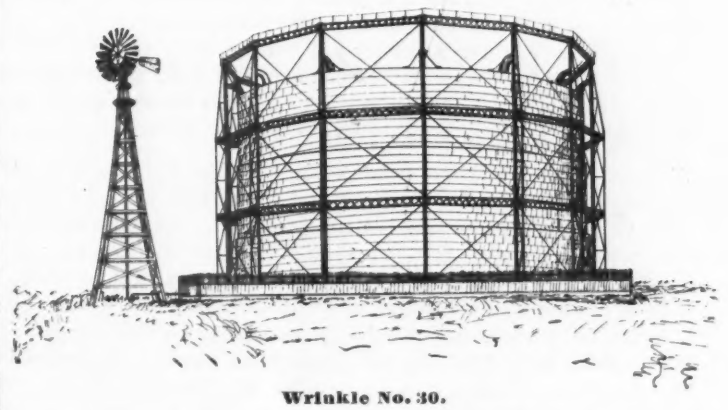
is used in St. Paul to show height of water in a dam situated at a distance from the power house, as follows (see Fig. 29): A shanty is built over the well and kept warm by an electric heater. *AC* and *FF* are No. 18 German silver wires mounted on maple plank about 6 feet long and divided to $\frac{1}{10}$ of a foot. *H* is a moving contact, moved by the float in the well, which communicates by the pipe *G* with the water in the dam. The pipe has a valve at the inner end. The contact *J* is moved by hand until the galvanometer reads zero. The resistances R_1 and R_2 are equal to the resistances of the wires *AB* and *CD*. The current used is about 3 amperes. When a balance has been obtained, the height of water is read directly from the lower scale. The device is a good one to use in connection with the reading of holders situated at a distance.—FRED. R. CUTCHEON, St. Paul, Minn.

No. 29.—*To Prevent Siphoning from Holder Tank where Exhaust Steam is Used.*—Fig. No. 30 is an excellent idea and will certainly prevent the water being siphoned from a holder where exhaust steam is used for heating purposes. The sketch is self explanatory: The check valve opening when the pressure relaxes on the exhaust steam pipe or when closing down the engine, permitting the air to enter the steam pipe and thus prevents siphoning. The openings shown by the arrow are for the exhaust steam to produce circulation in the tank. As many of these openings may be put in as are required, according to the capacity of the exhaust steam pipe.—V. L. ELBERT, St. Paul, Minn.

No. 30.—*Supplying Water to a Leaky Gasholder Tank.*—Fig. No. 31 shows a holder whose tank behaved so badly that it was compelled to associate with a windmill for punishment. This may appear to some as being a strange combination, but where a tank is leaking badly the scheme is certainly a good one for supplying water.—ANONYMOUS.

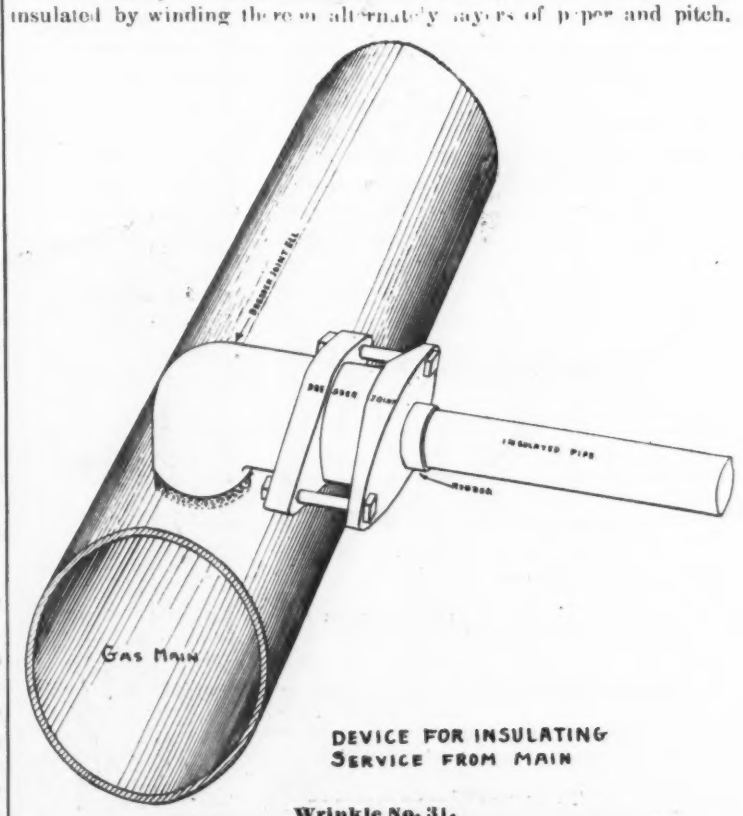


Wrinkle No. 29.



Wrinkle No. 30.

No. 31.—*Insulating a Service from Gas Main.*—Fig. No. 32 is an insulated service ell, designed by Mr. Von Maur and used in an experimental stage by the Laclede Gas Light Company. The service itself is insulated by winding thereon alternately layers of paper and pitch.



Wrinkle No. 31.

This makes an excellent insulator, and although sufficient time has not elapsed for a thorough test, conditions have already shown a wonderful improvement, either where the ell was used alone or in connection with the insulated service pipe.—D. VON MAUR, St Louis, Mo.

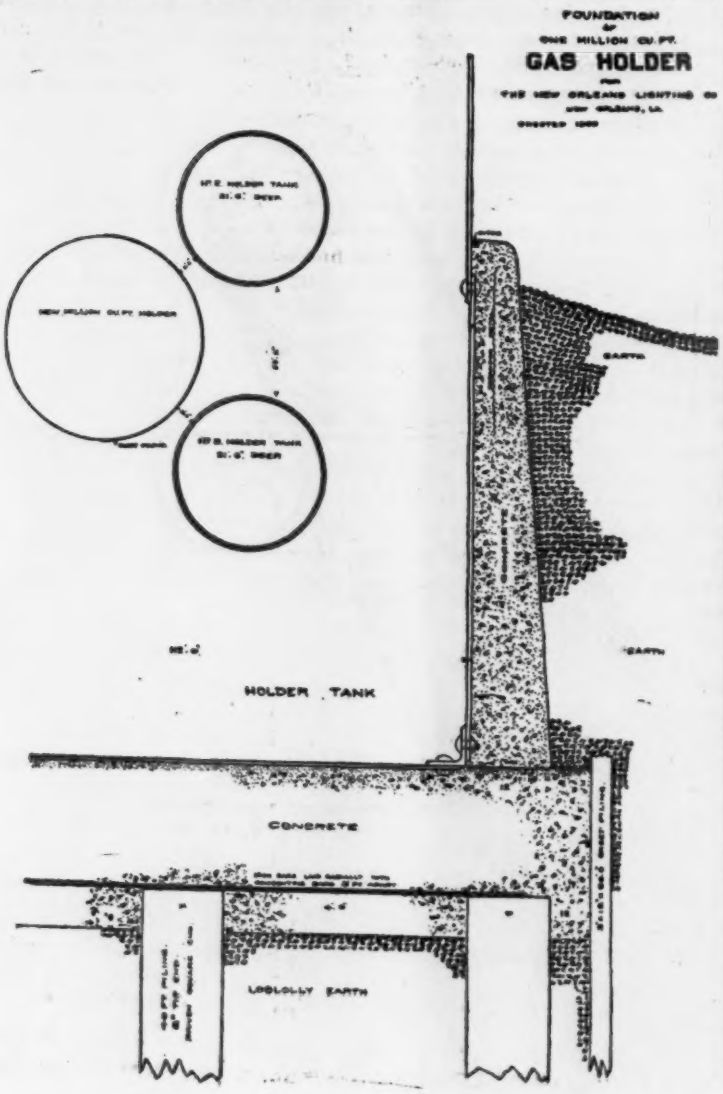
No. 32.—*Lime Stirring Device.*—In cases where a continuous lime feed is used on an ammonia still it is necessary to keep the lime water

stirred up. This may be done conveniently by the use of compressed air (we use a second-hand air pump bought from the railroad). The air is forced through the lime water by means of a cross (made of ¾-inch pipe with ¼-inch holes bored at intervals of about 6 inches) at the bottom of the lime well.—GRAND RAPIDS (MICH.) GAS COMPANY.

No. 33.—*Water Heater.*—A simple and economical scheme for providing hot water for wash room purposes where the ordinary means used are not convenient can be made as follows: An old closed-feed water heater with a bank of tubes, made up of pipes with return bends, was placed under the exhaust main at its low point where a trap would have been placed. The coil was connected with the exhaust main and a cold water connection was made to bottom and a hot water connection to top of body of heater. These were led to place of use and a return was made from extreme point of hot water piping. The other end of coil is connected to drip. The device thus serves the double purpose of heater and trap. The heater installed here holds 40 gallons, has 12 pieces, 6 feet long, of 1-inch pipe in coil, and with a small stream of condensation running through keeps water at 150° F. under fairly constant use.—GRAND RAPIDS (MICH.) GAS COMPANY.

No. 34.—*Regulating Air Purifiers.*—A simple device for regulating the air introduced in the purifiers may be made by the use of stove cocks. Use as many as necessary and connect them in parallel in the air line. You can then tell by experiment just what percentage each cock will deliver, and the desired per cent. can be obtained by using the required number of cocks.—GRAND RAPIDS (MICH.) GAS COMPANY.

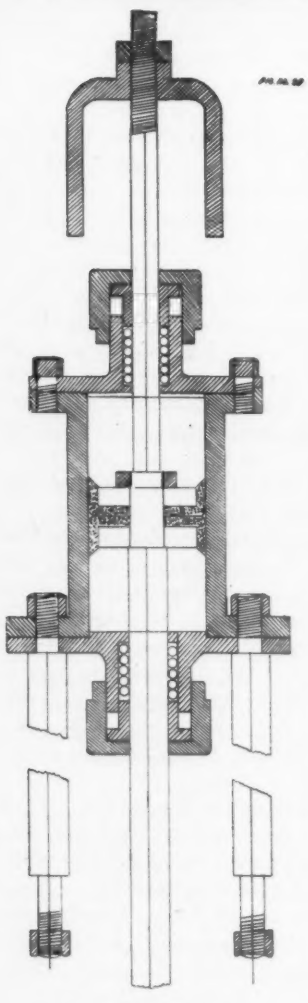
No. 35.—*The Erection of a Large Tank Holder in Close and Dangerous Proximity to Two Underground Tank Holders in Treacherous Soil.*—Fig. 33 shows the detailed construction of the foundation work with dimensions, while Fig. 34 gives a more comprehensive view of the sheet piling and piling, and the bed of blue clay and sand where we stopped our piles. This bed is 42 feet below the surface of the yard, and the piles were driven with a 5,000 pound Vulcan hammer from 1 to 8 feet at each blow until the end of the piles reached this bed of blue clay and sand. Several tests were made. Ten blows would not drive this blue clay and sand three-fourths of an inch. Six feet of concrete



Wrinkle No. 35.

were laid on the soft earth below the level of the top of the piles, and iron bars were laid radially on top of the piles and other bars laid concentrically on top of them, and the remaining 18 inches of concrete were then laid. The piles were driven after the excavation was made and were sawed to a level. The sheet piling, to protect underground holder tanks Nos. 2 and 3, was driven before any excavation was made. It appeared to be necessary that our piling should be driven below the natural water line of the earth, which was about 6 feet below the surface of the holder yard. Eighteen inches of concrete were decided as sufficient above the top of the piling. To build 6 feet to bring the tank entirely above the ground, would mean useless and great expense, so I decided to place the holder bottom several feet below the surface of the ground and protect it by means of a concrete wall built against the tank, and bank the earth up against this wall, making a nice drain for the surface water. Then, in order to prevent the water from going down between the holder tank and concrete, a 1-inch square groove was molded in the cement work and this filled with pitch.—T. D. MILLLER, New Orleans, La.

No. 36.—*Description of Hydraulic Valve for Operating Engine for Intermittent Blows and Runs, in Water Gas Set.*—In a generator house composed of several machines, there is a constant and steady demand for blast, hence the blower engine may be set at one speed for all time. But when there is only 1 machine in operation at a time, blowing say 5 minutes, then making gas 5 minutes, some method must be installed so as to control the engine on the run. Several methods have been devised, none of which were entirely satisfactory until the present scheme was installed. A 4-inch valve (a drawing of which appears below) has been placed on the stem line 5 feet from the engine and is operated by hydraulic pressure. This valve is connected up to the line that operates the stack valve and is controlled by a 4-way valve



Wrinkle No. 36.

in the generator house. The 4-inch valve is so connected that by adjusting the stem at the end of the valve any amount of steam can be passed through to the engine. The beauty of this service is that it is entirely automatic. The gas maker can go on operating his machine, paying no attention whatever to the speed of the engine, for when he closes the stack the engine slows down to whatever speed is desired, while at the instant he raises the stack it speeds up again, furnishing the required amount of blast. This method has been in use at the Minneapolis Gas Lighting Company for over 1 year and has proved entirely satisfactory. See Fig. No. 35. —F. C. SHEPARD, Minneapolis, Minn.

No. 37.—*Connecting Blower for Burning Out Retorts to Exhauster.*—Burning carbon out of retorts is best accomplished with dry air. A blower occupying a space of 18 by 18 inches and connected to the flywheel of an exhauster by means of a belt furnishes sufficient air to decarbonize two retorts in less time than required with steam and air, does the work better and requires less than 1-horse power to operate.—JAMES W. DUNBAR.

Discussion.

The President—Are there any questions which the gentleman would like to ask Mr. McAdam upon particular wrinkles? I think Mr. McAdam has no apology at all to offer. The work is fully up to the standard hitherto set, and the co-operation between the English gas engineers and the American gas engineers is certainly a cause for congratulation. I don't know whether it was the Scotch accent or the Scotch birth that brought it out, but it is very encouraging.

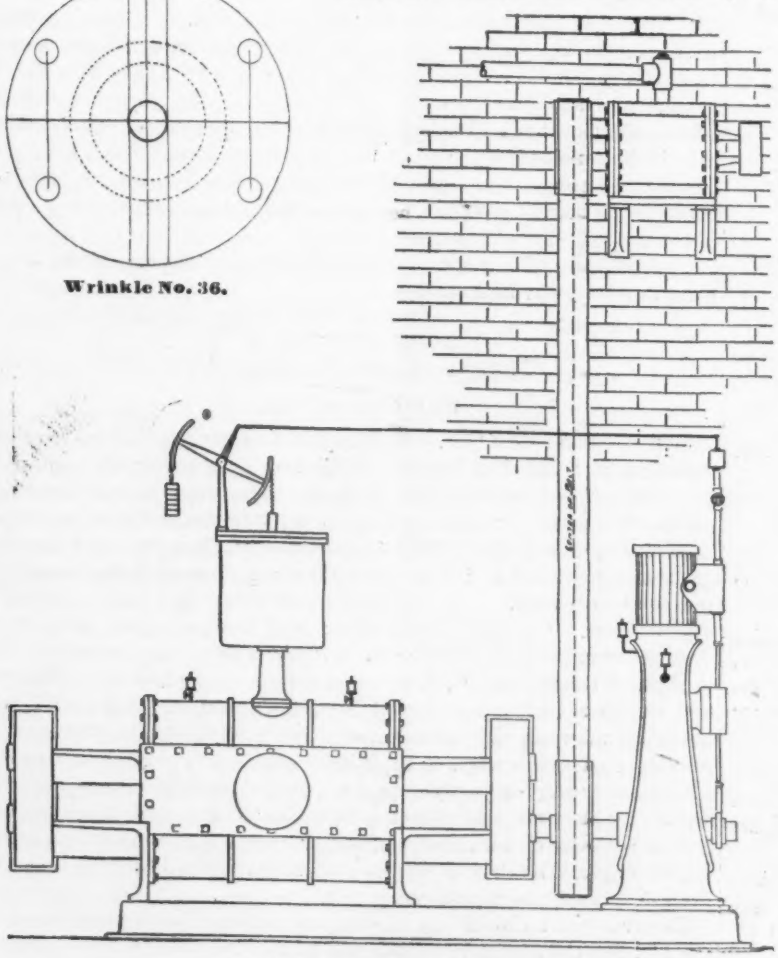
Mr. Elbert—I would like to ask Mr. McAdam if he knows whether they use a governor on the exhauster in addition to this governor?

The President—What wrinkle, Mr. Elbert?

Mr. McAdam—I confess I can't answer that.

The President—We have a contribution from Mr. Kersting, which will be incorporated in the proceedings.

Mr. Kersting—Believe me, I do feel highly honored at being requested to "take part" and would willingly do my best if I could be present. There are so many points in the gas business that an ordinary "gas man" could never conceive all the "best schemes" unaided; to succeed he must observe how "the other fellow" does things, and to those that cannot travel to other "works," for new and better ideas, especially, the Wrinkle Department is a "Godsend." I am particularly glad to see the contributions from "Across the Water." The several devices and methods will be very valuable to many of us, and require no explanation. Wrinkle No. 5 seems to be a good suggestion, especially in using the "improved jet photometer" in a combination plant, where the proportion of water and coal gas, and incendentally the S. G. (specific gravity) varies and it is necessary to have several different sized tips. The idea of the "toggle" on the "bar puller" Fig. 14, is a vast improvement over the "chain." The "automatic shut off" for sign and window lights by use of the P. P. meter is also a good suggestion. In connection with this secondary use of meters would say, that a very reliable "flashing sign" could be operated by the mechanical motion of the meter arms, etc., supplying the gas. With reference to the method of "revivifying in situ," described by Mr. Belton, shown in Fig. 23, it is a clever idea. I formerly accomplished the same end by using a home-made steam injector consisting of a full sized tee, a bushing and long threaded nipple, and controlled the amount of air by maintaining the required vacuum as shown by a U-gauge attached and drawing the air through a given sized orifice. The "open" style of hot coke buggy, Fig. 25, is certainly a great improvement over the "solid." And for smaller works still using the one wheel gas retort barrows, it would be a wise plan to have them made according to the "open" idea. The small rotary blower belted to exhauster pulley, works like a "charm" for supplying air for decarbonizing retorts, as I have tried it. As stated above, I think you made a mistake in selecting me to discuss the "Wrinkles," but if there is any clause in my letter which you think would help the fraternity, I feel more than repaid for burning the midnight oil. Inclosed please find samples of the several street information cards in use here. If the "Western" is making a col-



SHOWING METHOD OF ATTACHING BLOWER FOR DECARBONIZING RETORTS

Wrinkle No. 37.

SERVICE CARD.

Single.....
Double.....
Street..... No.....Date .....
Owner.....Tenant .....

Street Main Size.....Kind.....Depth.....Drips.....
Prop
Is on....side of street,.....feet.....of.....Curb Line
Condition.....Pressure.....Found .....

New
Service Renewed, Extended, Size.....Total Length.....
Front Prop Straight
Crosses Side Prop Line...of...House Line, Slanting Depth....
Back
Enters....side....of....-House Corner, Drips to.....Depth.....
Street Paving.....Soil.....Sidewalk.....
Top
Tap....Side Size... .....Style Connection.....

Fittings.....St. Ells,.....St. Ells,.....Ells
.....Tees.....Tees.....Plugs .....

Labor.....
.....
.....
Remarks Curb Cock.....
No Cock.....
.....Foreman.

On reverse side is shown property lines of one block with the streets at each end.

STUB SERVICE.

Street..... .....No.... ...Date..... .....
Owner.....Tenant.... .....
Intended to Supply.....

Street Main Size.....Kind.....Depth.... ....Drips.....
Is on....side of street.....feet.....of.....Prop Curb Line
Condition.....Pressure .....Found..... .....

Stub Size.....Total Length.....End.....
Location of Tap ...of.....Prop. House Line of No.....
Location of End....of.....Prop. House Line of No.....and
.....of.....Curb Prop. Line, Depth..... ....Slanting Straight.....
Tap ..Top Side Size.....Style Connection House .....

Fittings.....St. Ells,.....St. Ells,.....Ells
.....Tees.... .....Tees .....Plugs .....

Remarks.....
....Foreman.

On the reverse side are shown the property and curb lines of one street block.

DRIP RECORD.

Index No..... Date.....
Street..... ..... Nearest House No.....

Size Main....., Depth.... ....., Supply from.....
Style of Drip.....Capacity.....
Cares for..... feet.....feet.....
..... feet in.....street.....feet in . .....St.
Location of Drip.....from.....Prop. Curb Line .....
.....from.....Prop. Curb Line.....
Location of Pump Riser.....from.....Prop. Curb Line of
....from.....Prop. Curb Line of
.....
Soil..... Paving ... .

Remarks.....
.....
.....
See Sketch on other side. Signed.....

Reverse side is cross section lined.

MAIN SPECIALS. Date.....
Street..... .....Nearest House No.....

Description.. .....
....

Size Main....., Depth....., Drips..... ..
Supply from.....
.....
Cares for..... feet..... ....feet. .....
.....feet in.....St.....feet in.....St.
Location.....from.....Prop. Curb Line of.....
.....from.....Prop. Curb Line of.....
.....
Soil... ..... Paving.....

Remarks.....
.....
Signed.....

Reverse side is cross section lined.

lection of cards or yourself, please accept them as my contribution. Also find inclosed two contributions to the "Wrinkle" collection, am sorry I did not take time to send them to the editor in proper time.

The President—Are there any other members who have contributions in their pockets which they want to put in the proceedings, if so, they will hand them to the Secretary who will take care of them.

Mr. Walton Forstall—I think the cut on page 38 is upside down. It might get into print that way.

Mr. McAdam—I think it is all right. The lower part fits on the meter and the upper part is connected to the union on the prover hose.

Mr. Macbeth—I don't think that cut is upside down. The pipe to which attachment shows connected is the standpipe of the meter. I have not read note under cut, but have seen an attachment similar to the one shown.

Mr. Walton Forstall—Mr. President, as long as this question has been brought up it might as well be threshed out. It says: "Top end *A* is the female portion of the union of the prover hose, the lower end is the male portion of the meter union, on which is a leather washer, this fits into the barrel of the meter, and is sprung into place as you would on a bottle." Now, "*A*" is certainly not at the *female* end.

The President—Is there any further comment? Mr. Waring.

Mr. Waring—I would like to make a suggestion. The Wrinkle on page 79 appeals to me very much, in which a holder has to associate with a windmill. I think it would be better if they did not associate so closely. In other words, a short circuit there would tend to induce greater leakage in the holder. If they put them across the yard from each other I think it would be quite an improvement.

Mr. McAdam—The fault there may be merely a shortage of ink. You can move it a little further over if you wish.

Mr. Norris—If you will turn to page 38, which Mr. Forstall spoke of, you will see that the cut is all right, but the description is wrong. The way that thing works is this: The sketch shows an appliance of which it is necessary to have one for each size of meter. The upper or male end of the appliance, *A*, screws into the end of the prover hose, and the other, or female end, has an adjustable joint and simply snaps into the place on the meter. Whenever you start to test a meter of a different size you have to change your appliance. So the cut is not upside down at all, but the description is not correct, as there is a confusion in the use of the terms male and female.

The President—Mr. McAdam, will you close the discussion?

Mr. McAdam—I would just like to call your attention to some errors that appear in this paper. I ought to have done this in the first place. On page 26 the signature should read James Stelfox, Engineer and Manager, Belfast, Ireland. On pages 40 and 41 you will notice that Mr. Slade gives a contribution which he also sent to the Ohio Gas Light Association Wrinkle Department. On page 46, No. 15 is the pulling device as used in Milwaukee, On page 49 at the end of the first paragraph of Mr. Brown's wrinkle, it should read: "By means of a hose." The word "or" takes the place of "of" in the paper. I have nothing particular to say in closing the Wrinkle Department. I am sorry, however, that it did not get up to the standard, and I expected to hear considerable applause from you gentlemen. Kindly take into consideration the fact that I was elected to this office by some of my enemies who had a fancied grievance against me for something which I did not intentionally do, and my election was supposed to be a means of punishment. I assure you that the punishment has been severe. (Applause.)

The President—I have pleasure in extending the thanks of the Association to you, Mr. McAdam.

(To be Continued.)

Comets in the Gas Industry.[1]

By "An Observer."

Self-Purification of Gas.—An idea that has attracted a great deal of attention at times has been the subject of practical experiment, and has even offered considerable prospects of success, is self-contained purification of gas by means of its own constituents, without the aid of lime, oxide, or any other extraneous subtances. But yet one finds that gas is being purified to-day on much the same lines as those adopted at the commencement. It is still washed, scrubbed and passed through dry purifiers. The introduction of oxide of iron, as either entirely or to some extent displacing lime, is the only radical improvement; although, of course, many advances in details connected with washers and scrubbers have been effected from time to time. But apart from these, we may say that gas is now purified as it was in the days of Murdoch. Theoretically, it may be wasteful and wrong to employ additional or outside purifying agents, in the same sense that it is barbarous to burn tar and dissipate its valuable constituents in smoke. But as a matter of business it pays to do so; and the present methods are so simple, reliable and cheap, that they require a lot to beat them, even if the material is provided *gratis*.

The first great obstacle in the way of self-contained purification is the fact that the statement—like many others that find general credence—is not an entire presentment of the truth. The assumption is that the volatile alkali, or ammonia, can be made to combine with the acid

1. *Journal of Gas Lighting.*

impurities (carbonic acid and sulphuretted hydrogen), forming soluble salts that can readily be dissolved out by water. If the crude gas as it leaves the retorts contained sufficient alkali for this purpose, the problem would be greatly simplified. But it does not contain more than ¼ to ⅓ of the requirement, and this at once brings in a large order. In addition to the purifying apparatus proper there must be a revivification plant of 4 to 8 times the capacity, to provide sufficient "free" alkali; and every particle of the alkali produced must be turned over 4 to 8 times. So, before going very far into the question, it is evident that the self-contained process not only calls for considerable additions to existing scrubbers and washers, but an elaborate system of apparatus, storage tanks, pumps, etc., in connection with secondary operations. When these points are properly appreciated, and the additional apparatus is compared with the complete equipment of dry purifiers, lime shed, and oxide shed, it is obvious that there is no advantage in the introduction of any elaborate processes, which even skilled chemists cannot always keep under proper control. The purifying process must above all things be steady and reliable, well in harness, and not liable to kick over the traces.

The purification of gas presents several different features from ordinary chemical operation. It is one thing to prepare a stock of solid or liquid crude products and purify them at convenience, and quite another thing to deal with a gas that must be treated in transit, from the retort to the holder; that is not only extremely bulky, but also has to be brought to a degree of purity far beyond what is usual in regard to other products. The impurity remaining in coal gas as prepared for distribution is stated in small fractions per cent. So that no gas engineer would take the responsibility of working any liquid process—self-contained or otherwise—without the precaution of a dry purifier of generous proportions, for use as a catch-box.

Probably, the use of an entire liquid purifying process would not be regarded as an insuperable objection now, though at one time there was considerable feeling against excessive washing or scrubbing, and some gas engineers objected to cold water, on behalf of the gas, as strongly as any tramp or street arab could resent its application to his own person. It was supposed to depreciate illuminating power, to aggravate the formation of naphthaline, and to conduce to stoppages But the foundation of these ideas was bad or insufficient condensation. No doubt, it is a mistake to douche hot gas with water at an appreciably lower temperature, or to regard the washers and scrubbers as tar extractors; as if the gas is subjected to sudden changes of temperature or to intimate contact with cold tar, trouble is sure to follow, The proper function of washers and scrubbers is that of purifiers wherein liquids are applied for the absorption of such impurities as can be removed by these means. If the gas has previously been reduced to atmospheric temperatures, and freed from suspended matters, the liquid used is also at atmospheric temperature, and both it and the apparatus reasonably free from tar, no harm can ensue from a liberal liquid treatment. At present the objections to liquids are of a practical character rather than theoretical.

Another Flicker Photometer.

Some types of flicker photometer devised on the Continent were described in the London *Journal* earlier this year, and one emanating from England now calls for notice. It is the invention of Mr. Lancelot W. Wild, who has described it in the last issue of the *Electrician*. He first discusses the errors incidental to other modes of photometry with special reference to the flicker principle, and then proceeds to show how he avoids the chief sources of error by means of his new device.

The errors to which he more particularly refers are those of angularity, which, as is well known, may be very serious, especially with the wedge type of screen, and with lights such as electric glow lamps, of which the center of the field from which the light emanates is not easy to locate. He defines the art of photometry broadly as consisting in judging the illumination of two contiguous surfaces, each of which is lighted from a separate source, and the ideal screen (which is never realized in practice) as one that appears to be equally illuminated at any angle of view, while the illumination is exactly proportional to the cosine of the angle from the perpendicular at which the light rays strike the surface of the screen. In order to ascertain the magnitude of the error due to the variation of the apparent illumination of a screen with the angle of view, Mr. Wild made observations with a Bunsen disk set up between two lights, one of which was moved until a balance was obtained—the disk being viewed at different angles in turn. For the screen in question, it appears from the results of these observations that the best angle of view is about 50° to 60°, and it seems preferable in precise photometry to choose some such angle.

Mr. Wild goes on to discuss the wedge pattern screen, and shows how the Ritchie or other wedge which stands upright upon the triangular base is liable to induce serious errors in observation, if there is any appreciable horizontal side play in the mounting of the screen or its carriage. If, as is common with such wedge screens, the rays strike the surface at an angle of 60°, then if the play of the carriage admits of it being displaced 1° horizontally, the illumination of one surface will be increased by 3 per cent., and that of the other reduced by 3 per cent.; so that the total error will be 6 per cent. As such displacement of the carriage is by no means abnormal with photometers, the error involved thereby may commonly amount to 6 per cent. and more. The Simmance-Abady photometer avoids this source of error, because the wedge is placed with the apex of the triangle upwards. But even with it, if the carriage does not travel truly, or if the bar is not straight, error is introduced. With the tilting form of this photometer, an error of 1° in the setting of the tilting scale, which may occur by inadvertence, will cause an error of 5 per cent. in the measurement. If the photometric screen is of a pattern in which the surfaces are parallel and perpendicular to the rays of light, tilting of the carriage is of no moment. The Ritchie or other up ended wedge when set 30 inches from one of the lights will have an error of 3 per cent. if the light is displaced horizontally by ½ inch, which displacement causes the rays to impinge upon the screen at 59° or 61°, instead of 60°. If both lights are out of line to this extent, the total error may attain 6 per cent. Vertical displacements of like degree may cause 5 per cent. error with the Simmance-Abady photometer.

Such displacements inadvertently occur in setting up electric glow lamps with irregular filaments. With screens, however, which are struck perpendicularly by the rays, a small want of alignment is of no moment. Simmance-Abady and Whitman types of flicker photometer suffer on account of their angularity errors, and personally Mr. Wild would prefer to use a simple Bunsen disk for comparing lights differing in color even as greatly as a Welsbach light and a flame arc lamp. But as a flicker photometer is frequently desirable he has devised one which, as far as may be, embodies principles which he sets forth as essential to the avoidance of angularity errors—viz., the use of parallel screen surfaces, both perpendicular to the light rays and viewed through a tube so that the angle of view is fixed.

Fig 1

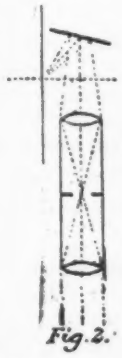


Fig. 2.

He employs a disk of the pattern shown in the annexed diagram (Fig. 1), cut out of blotting paper and treated as to one-half with paraffine wax, so that half the disk is translucent and diffusing and the other half opaque and reflecting. This disk is rotated about its center by means of a small electric motor, and a telescope is used to view in a mirror the image of a small portion of the upper part of the rotating disk. The effect of the telescope is to focus the eye upon the image of this portion of the disk, with the result that great sensitiveness is secured and the eye is less fatigued. With this arrangement, which is shown in Fig. 2, no angularity error was detected by Mr Wild even when the photometer was tilted 10 per cent. out of truth, or when the lights were as much as 6 inches away from the axial line.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

Messrs. H. M. Byllesby & Company, incorporated, engineers, Chicago, have been appointed engineers and managers of the Mobile Electric Company, of Mobile, Ala. A new modern power house will be erected immediately and the lines of the Company extended and rebuilt.

The Lindsay Light Company are distributing an exceedingly handsome 11 by 14-inch poster of the "Lindsay Girl," painting by Arthur, photograph color by Brown and Bigelow, St. Paul, Minn. It's worth sending for, if you have not received it.

It is rumored that the Standard Oil Company is going to purchase the Portland (Ore.) Gas Company.

The city of Altoona, Pa., has accepted $873.18 as full settlement of water used by the Gas Company and not metered. A disgruntled discharged employee is said to have furnished the city with false informa-

tion which caused it to bring suit for several thousand dollars, which the Gas Company refused to pay, and was sued by the city.

THE Street and Sewer Department of Wilmington, Del., passed the franchise of the Commercial Light, Heat and Power Company over the veto of Mayor Wilson. President Johnson voted against the franchise being passed over the veto, but Directors Gray and Melvin voted for it, and that gave the necessary two-thirds vote. The Company accepted the franchise, and it is said will start the construction of a gas plant as soon as possible.

THE St. Johnesbury (Vt.) Gas Company will begin supplying gas about September 1st.

THE Quincy, Mass., gas mains are now supplied with Boston gas through the 12-inch pipe recently laid.

MR. E. F. GOGGIN, who has been employed by the Marlboro-Hudson (Mass.) Gas Company, has gone to Rochester, N. H., to act as representative of the local gas company.

THE Gas and Electric Light Commissioners issued an order requiring the reduction of the price of gas supplied by the Natick (Mass.) Gas Company to a net rate of $1.75 per 1,000, to take effect September 1 next. The present price is $2 per 1,000, with a reduction of 10 cents for prompt payment, making the net price $1.90.

THE Boston (Mass.) Consolidated Gas Company will next month, in accordance with the requirements of the sliding scale act, make an official announcement of the actual cost per 1,000 feet of its gas in the holder, for the fiscal year ending June 30, 1906. This statement will be the first of its kind ever issued by the Company.

AMONG the surprises at Council meeting at Pottstown, Pa., was the application by Pottstown capitalists, headed by George S. Miller, cigar manufacturer, for an ordinance granting permission to use the streets for a new gas plant, which proposes to sell gas at the following figures: $1.05 for the first 1,000; 95 cents for the second; 85 cents for the third; 75 cents for the fourth, and 65 cents for the fifth and more. The new Company also proposes to furnish free gas to the borough hall and for public purposes, to the extent of 40,000 feet per month. The ordinance passed its first reading and will be given its second and third reading at the September meeting.

MR. W. A. ALDRICH, who for 15 years was the successful Secretary and Manager of the Spokane Falls Gas Light Company, leaves for Tacoma, Wash., where he will assume the duties of General Manager of the Tacoma Gas Light Company. Some months ago Mr. Aldrich left Spokane on being tendered the position of Vice-President and General Manager of the Pulaski Gas Company, of Little Rock, Ark., but when the more advantageous offer came, unsolicited, from Tacoma, he decided to accept it.

JUDGE J. R. MACFARLANE handed down an opinion in Common Pleas Court No. 1, in the case of Harry C. Sawyer and E. Stoner vs. the City of Pittsburgh, and F. M. Bigelow, formerly Director of the Department of Public Works. In the opinion the injunction against the city of Pittsburgh, Pa., which makes void the contract for street lighting entered into with the Welsbach Street Lighting Company of America, is made permanent and final. In his finding of fact, Judge Macfarlane finds that the Sun Vapor Light Company, which was one of the three bidders for this contract, and which Company bid a higher figure than the Welsbach Company, is a subsidiary concern of the Welsbach Company, as was proven by that Company's own testimony. This fact, the court states in his conclusions of law, voids the contract. Therefore the preliminary injunction is made final.

THE Pulaski Gas Company, of Little Rock, Ark., has reduced the price of gas from $1.50 per 1,000 to $1.25 net.

THE West Shore Gas Company, incorporated last December with a capital of $45,000, has taken over the property of the Haverstraw (N. Y.) Light and Fuel Gas Company, and will continue the business in that village.

MR. FRANK PRICE, the petitioner for a 50-year gas franchise in the city of Coeur D'Alene, Idaho, an ordinance for which has passed its first and second reading, has been requested to give a bond for the faithful performance of the promised installation of his gas plant. The franchise will pass if nothing unforeseen occurs to prevent at the next council meeting.

NATURAL gas will take the place of the artificial gas in a short time in Middletown, O. It will be furnished by the Middletown Gas and Electric Light Company. The pipes of the old Company will be used and the old Company will have complete control, carrying out the provisions as contained in the franchise given to the Ohio Fuel Supply Company. This is a happy solution of the question. It prevents the tearing up of 3 streets and places the work of furnishing the gas in the hands of a local concern that is informed of the needs and requirements of the people. It has also the advantage of making it possible at any time should the natural gas not prove sufficiently abundant to return to the old system.

MR. H. E. WIMPERIS, a member of the Institution of Civil Engineers in England, has written an article stating that the attention of the English manufacturers is being drawn more and more to the great vogue on the Continent of the waste power gas engine. Dr. H. Hoffman recently read a paper before the Society of German Engineers on the subject, in which he estimated that in Germany no less than 600,000-horse power might be obtained from the surplus gases of coke ovens, and an additional 1,000,000-horse power from the waste gases of blast furnaces. The first gas engine plant dealing with coke oven gases was put into operation in 1894 in Germany, and there are now constructed or under construction, gas engines capable of delivering no less than 400,000-horse power when operated with "poor gases." Mr. Wimperis says: "During last year alone one German firm is reported to have constructed 140 such engines of a combined capacity of 120,000-horse power. This shows a movement of the keenest vitality. Less progress has been made in the United States, but American engineers are watching affairs very closely and are not likely to allow themselves to be left far behind in any improvement which makes for economy in manufacturing costs. Mr. Rossi, an American, has estimated that the power which could be saved in the metallurgical industries of the States must amount to some millions of horse power, and he has expressed the opinion that an output of fully 1,000,000-horse power could be maintained continuously."

THE Elkhart (Ind.) Gas Company, without previous warning, advertised a reduction of its rates from $1.80 per 1,000 cubic feet, less 5 cents discount, to $1.20 per 1,000 feet, less 10 cents discount.

THE latest proposition at Richmond, Va., is to put the matter of improvements to its municipal plant in the hands of Humphreys & Glasgow, which latter would accept the charge only under condition that there should be no competition. All kinds of rumors are afloat concerning the past attempts of Council to dispose of this knotty problem. With all its troubles over the gas plant, the city is actually considering the installation of a municipal electric light plant!

THE Peoria (Ills.) Gas and Electric Company plan to spend $100,000 on their gas plant and in extending gas mains throughout the city. New buildings on the Company's property will be constructed, together with 16 more miles of gas mains, making the total of 125 miles. About $45,000 is to be spent in new buildings and improved machinery, which will include a new condensing house, the enlarging of the retort house and the abandonment of an old building used for that purpose, and a new station meter room.

THE city of Iola, Kas., took charge of the gas plant, paying as the remainder of the purchase price of what was in round figures, 90,000, $6,810.59. Of this $90,000, $65,000 was the original purchase price of the plant, and the remainder of the $90,000 represents betterments. The figures of the Gas Company and the city were the same, and there were no differences to adjust. The city made the contract for the purchase of the plant Jan. 1, 1905.

W. W. S. BUTLER, of Grand Rapids, Mich., has been appointed General Manager of the Newport News and Old Point (Va.) Railway and Electric Company, and its constituent Companies, the Citizens Railway, Light and Power Company, Norfolk and Atlantic Terminal Company, Hampton Roads Traction Company, and Newport News Gas Company. He was Gen. Supt. of the Grand Rapids street railways.

THE Gas and Electric Development Company, of Philadelphia, Pa., announces the sale of the Dansville Gas and Electric Company, of Dansville, N. Y., to Philadelphia parties. The plants will be overhauled and much new machinery installed. The property will be operated by the Gas and Electric Development Company for the new owners.

THE AMERICAN GAS LIGHT JOURNAL

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PROPRIETORS.

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OHIO GAS LIGHT ASSOCIATION.

NOTIFICATION RESPECTING ADVERTISING.

Orders for new advertising, or for changes in standing advertisements, to insure attention in the issue following their reception, must be in hand any time of Wednesday.

AGENTS:

New York—American News Co., 39 and 41 Chambers St.
Germany—Lemcke & Buechner, of New York.
England—Aug. Siegle, 30 Lime Street, London.

MONDAY, AUGUST 20, 1906.

The Market for Gas Securities.

The directors of the Consolidated Gas Company have declared a quarterly dividend of 1 per cent. payable September 15th. Judge Giegerich in the Supreme Court decided that the Consolidated Gas Company must furnish gas to consumers at the statutory rate of 80 cents per 1,000 feet. This decision was made in the case of Eionegi Rebecchi, who applied for a peremptory writ of mandamus to compel the gas company to serve him with gas at 80 cents per 1,000 feet.

Gas Stocks.

Quotations by George W. Cless, Broker and Dealer in Gas Stocks.

16 WALL STREET, NEW YORK CITY.

AUGUST 20.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share.

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated	$78,177,000	100	138¼	139
Central Union Gas Co.—				
1st 5 s, due 1912, J & J	3,000,000	1,000	101	104
Equitable Gas Light Co.—				
Con. 5's, due 1932, M. & S.	1,000,000	1,000	..	105
Mutual	3,500,000	100	225	250
New Amsterdam Gas Co.—				
1st Con. 5's, due 1948, J. & J.	11,000,000	1,000	100	103
New York & Richmond Gas Co. (Staten Island)	1,500,000	100	37	42
1st Mtg. Gold Bds. 5 p. ct.	1,000,000	..	98	104
Northern Union—				
1st 5's, due 1927, J. & J.	1,250,000	1,000	101	103
New York and East River—				
1st 5 s, due 1944, J. & J.	3,500,000	1,000	108	111
Con. 5's, due 1945, J. & J.	1,500,000	..	104	110
Standard	5,000,000	100	140	160
Preferred	5,000,000	100	155	175
1st Mtg. 5's due 1930, M. & N.	1,500,000	1,000	104	108
The Brooklyn Union	15,000,000	1,000	110	130
1st Con. 5's, due 1948, M. & N.	15,000,000		107	..
Yonkers	299,650	500	130	..
Out-of-Town Companies.				
Bay State	50,000,000	50	5/16	¾
" Income Bonds	2,000,000	1,000	..	75
Binghamton Gas Works	450,000	100	..	65
" 1st Mtg. 5's	500,000	1,000	95	100
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	9	10
" " Bonds, 5's	5,250,000	1,000	75	80
Capital, Sacramento	500,000	50	..	35
Bonds (6's)	150,000	1,000	..	..
Chicago Gas Co. Guaranteed Gold Bonds	7,650,000	1,000	104	106¾
Cincinnati Gas and Electric Co.	29,500,000	100	103½	103¾
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	90	..
Columbus (O.) Gas Lt. & Heating Co	1,682,750	100	..	95
Preferred	3,025,500	100	107½	108
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" Inc. 5's	16,000	100	98½	100
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Fort Wayne	2,000,000	..	..	..
" Bonds	2,000,000	..	85	..
Grand Rapids Gas Lt. Co. 1st Mtg. 5's	1,225,000	1,000	104½	105
Hartford	750,000	25	190	200
Hudson County Gas Co., of New Jersey	10,500,000	..	110	112
" Bonds, 5's	10,500,000	..	107½	108¼
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" Bonds, 5's	2,650,000	..	104½	105
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" 1st Mtg. 6's	350,000	1,000	106	108¾
" 6 per cent. scrip, due 1910	100,000	25	85	87
Massachusetts Gas Companies of Boston	25,000,000	100	58¾	59
Preferred	25,000,000	100	93½	93¾
Montreal, Canada	2,000,000	100	218	218¾
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2d "	2,500,000	1,000	104	..
Rochester Gas & Elec. Co.	2,150,000	50	83	..
Preferred	2,150,000	50	118	..
Consolidated 5's	2,000,000	..	104½	105¼
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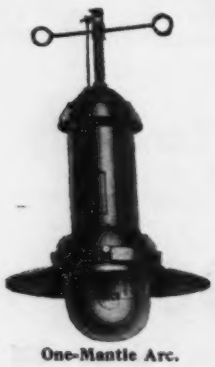

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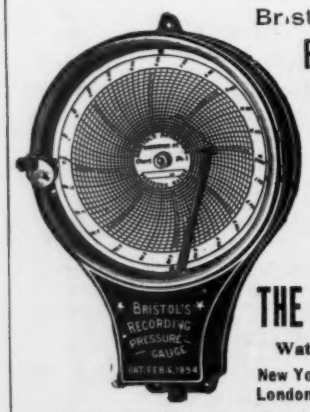

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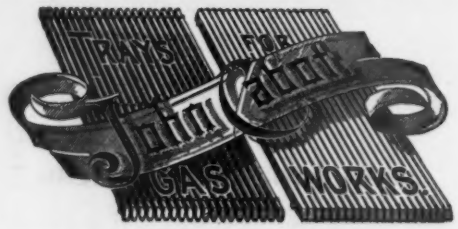

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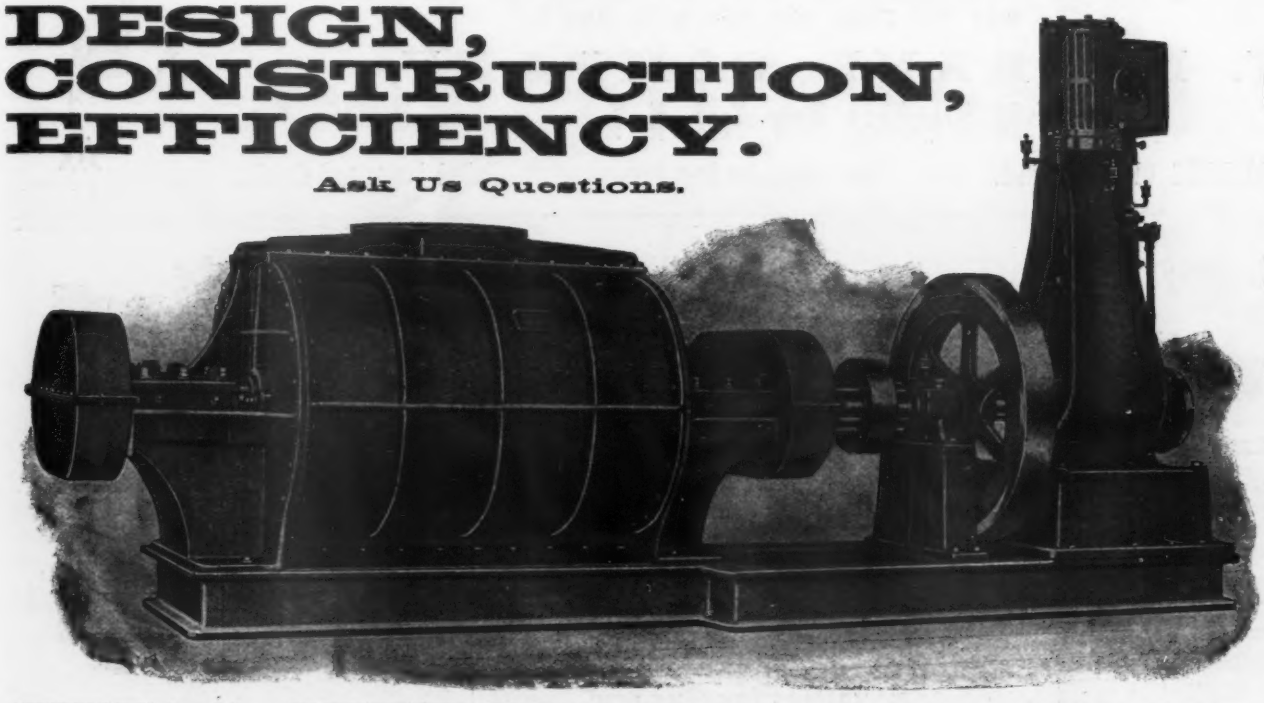

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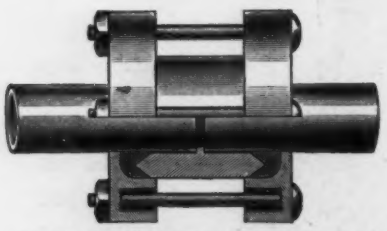
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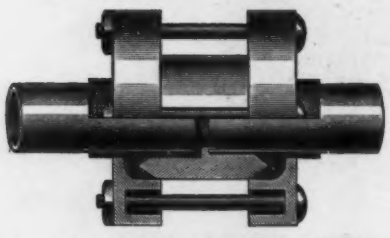
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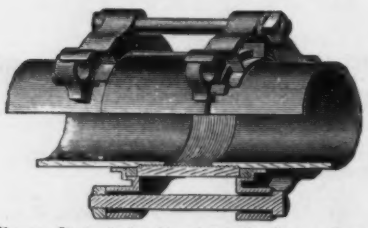
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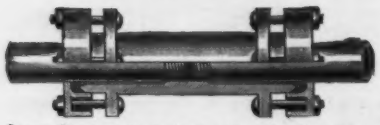
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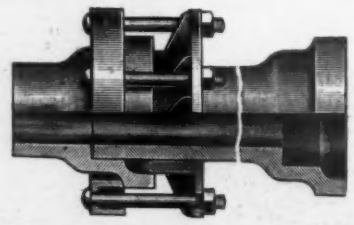
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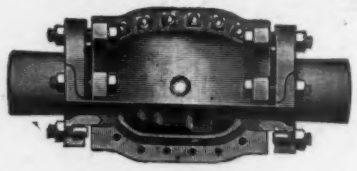
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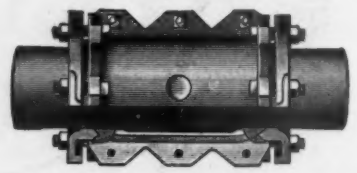
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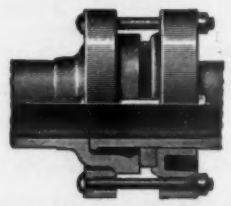
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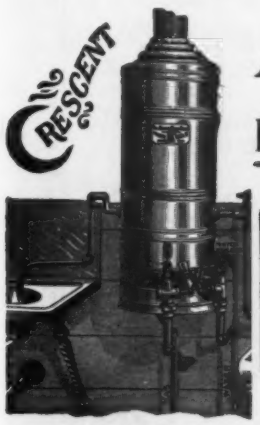

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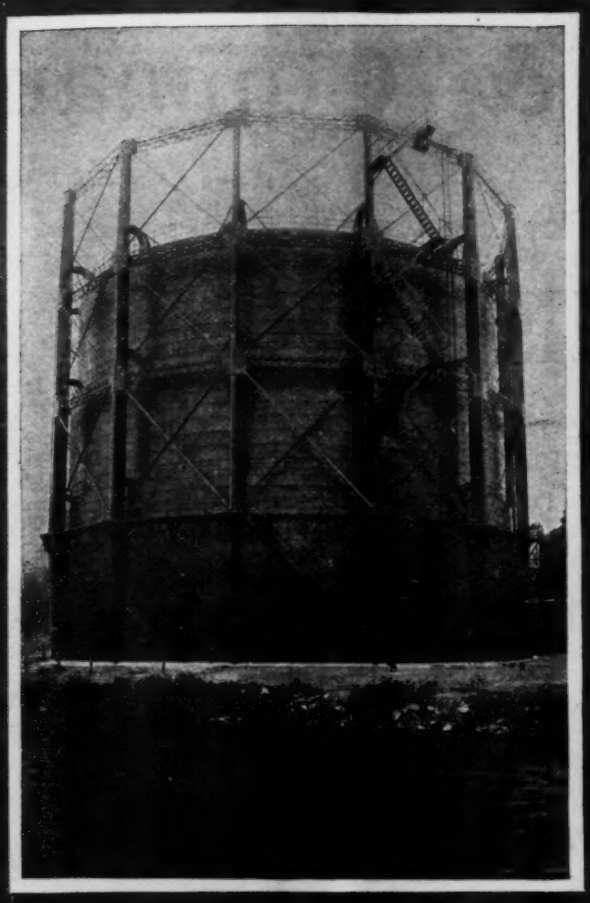

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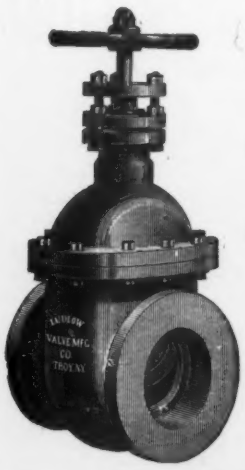

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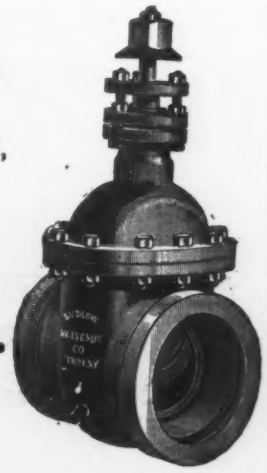

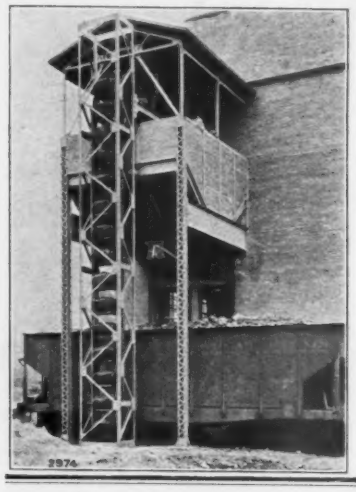

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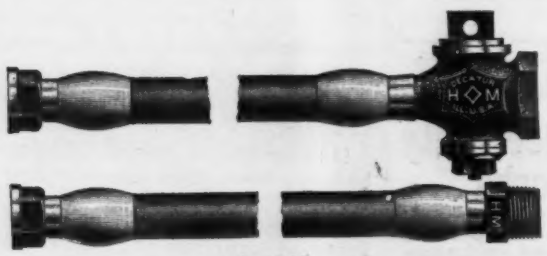

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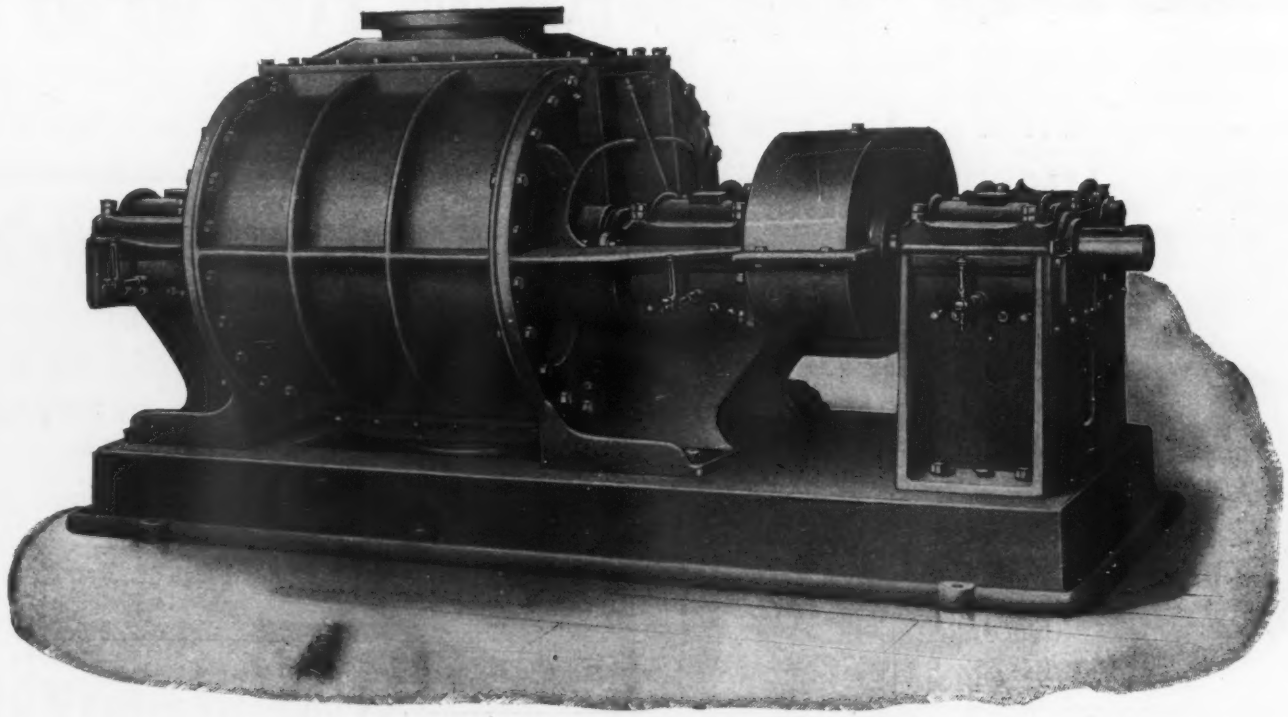
The highest efficiencies obtained. Most perfect devices for adjustment and maintenance of proper alignment. Use our flexible coupling to correct troubles caused by misalignment and engine shaft thrust. Our gas governor is the best. By-pass, gas valves and fittings.



P. H. & F. M. ROOTS COMPANY,

HOME OFFICE: Connersville, Ind. NEW YORK OFFICE: 120-122 Liberty St. CHICAGO OFFICE: 1547 Marquette Bldg.

250 Retail Shops
OF
LIPTON'S, LTD.,
IN

England, Scotland and Ireland, are to be Lighted with

Humphrey Gas Arc Lamps.

The work of installation is in progress; an additional car load of lamps is in transit and others to follow.

We believe this to be one of the most noteworthy contracts over obtained on gas lighting work.

NEW YORK:
46 West Broadway.
SAN FRANCISCO:
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GENERAL GAS LIGHT CO.,
KALAMAZOO, MICH.

GEORGE ORMROD, Mangr. & Treas., Emaus, Pa.
JOHN DONALDSON, Prest., Betz Bldg., Phila., Pa.

EMAUS PIPE FOUNDRY.

DONALDSON IRON COMPANY. EMAUS, PA.

MANUFACTURERS OF

CAST IRON PIPE AND SPECIAL CASTINGS

FOR WATER AND GAS.

Also, FLANGE PIPE, LAMP POSTS, Etc.

GAS TAPPING MACHINES

—FOR—

Drilling and Tapping Pipe under Pressure

WITHOUT ANY ESCAPE OF GAS.

They are Strong and Compact.

Size of Combination Drills and Taps ¾ to 4-inch.

Machines Sent to any Gas Company for Thirty Days' Trial.

Send for Circulars.

Geo. Light,
DAYTON, O.

"THE MINER"
Globe Street and Boulevard Lamps.

Cheapest and Best

THOUSANDS IN USE WITH INCANDESCENT BURNERS.

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821-823 Eagle Av., N.Y.

GASHOLDER TANKS AND GAS WORKS MASONRY COMPLETE.

Plans prepared and Estimates furnished at short notice.

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Practical Handbook on

GAS ENGINES,

With Instructions for Care and Working of the Same,

By G. LIECKFELD, C.E.
Translated with Permission of the Author,
By GEO. M. RICHMOND, M.E.

Price, $1. For Sale by
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Gas Engineer's Pocket-book, —BY— HENRY O'CONNOR,

Comprising Tables, Notes and Memoranda relating to the Manufacture, Distribution and Use of Coal Gas, and the Construction of Gas Works. PRICE, $3.50. For Sale by
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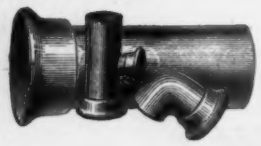
WARREN FOUNDRY AND MACHINE CO.,

Established 1856. Works at Phillipsburgh, N. J.

New York Office, 170 Broadway.



CAST IRON WATER AND GAS PIPE,

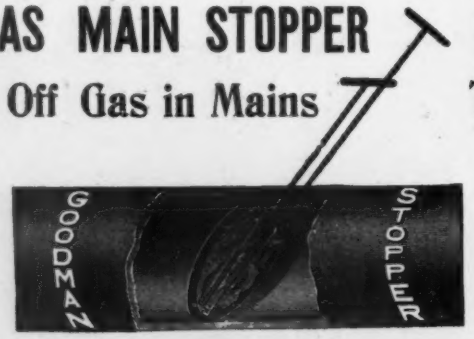
FROM THREE TO FORTY-EIGHT INCHES DIAMETER. ALSO, ALL SIZES OF

Flange Pipe for Sugar House and Mine Work. Branches, Bends, Retorts, etc., etc.

SAFETY GAS MAIN STOPPER COMPANY,

For Shutting Off Gas in Mains

Any size gas main can be shut off in 30 seconds. : : :



Temporarily during alterations and repairs. : : : :

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Address: SAFETY GAS MAIN STOPPER CO., 552 E. 135th St., New York City.

Telpherage for Gas Works.

At the plant of the Lowell Gas Light Co., Lowell, Mass., we installed, recently, a coke and ashes-handling Telpher. Let us tell you in detail what is accomplished and saved by this equipment.

Everything can be handled by Telpherage.
State your case—and ask for booklet 53.

UNITED TELPHERAGE DEPARTMENT
The Dodge Coal Storage Co.

Philadelphia—Hunting Park Ave. and P. & R. Ry.
New York—49 Dey Street.
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Pittsburgh—1501-2 Park Building.
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Chollar's System of Gas Purification.

THE PURIFIED GAS REVIVES THE FOULED OXIDE.

Four Roll Troughing Idler
FOR WIDE BELTS.
The positions of the rolls conform to a natural and uniform curve of the belt.

BELT CONVEYORS

EQUIPPED WITH

BALL BEARING ROLLS

Possess greater efficiency, consume less power, and the belts last much longer than when any other type of roll is employed.

Permit us to tel you why and to submit plans and estimates.

Link-Belt Company
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AMERICAN METER CO.,

NEW YORK, ST. LOUIS, PHILADELPHIA, SAN FRANCISCO, CHICAGO,

Photometrical and Experimental Apparatus.

PUBLIC LIGHTING TABLE.

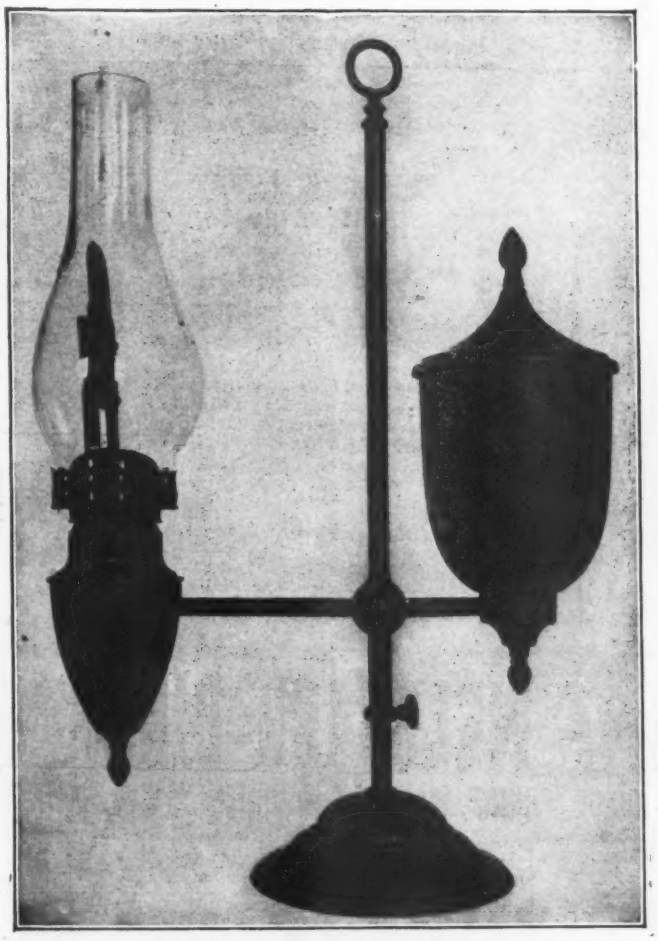
SEPTEMBER, 1906.

Day of Week.	Date.	Table No. 1. FOLLOWING THE MOON. Light.	Extinguish.
Sat.	1	No L.	No L.
Sun.	2	No L. FM	No L.
Mon.	3	No L.	No L.
Tue.	4	7.00 PM	8.40 PM
Wed.	5	7.00	9.10
Thu.	6	7.00	9.40
Fri.	7	7.00	10.10
Sat.	8	7.00	10.40
Sun	9	6.50	11.10
Mon.	10	6.50 LQ	11.50
Tue.	11	6.50	12.40 AM
Wed.	12	6.50	1.30
Thu.	13	6.50	2.20
Fri.	14	6.50	3.20
Sat.	15	6.50	4.40
Sun.	16	6.30	4.40
Mon.	17	6.30	4.40
Tue.	18	6.30 NM	4.40
Wed.	19	6.30	4.40
Thu.	20	6.30	4.40
Fri.	21	6.30	4.40
Sat.	22	6.30	4.40
Sun.	23	8.40	4.50
Mon.	24	9.30 FQ	4.50
Tue.	25	10.30	4.50
Wed.	26	11.30	4.50
Thu.	27	12.30 AM	4.50
Fri.	28	1.40	4.50
Sat.	29	2 40	4.50
Sun.	30	3.50	4.50

TOTAL HOURS DURING 1906.

By Table No. 1.

	Hrs.Min.
January	223.40
February	190.40
March	192.10
April	167.00
May	152.20
June	142.10
July	150.20
August	157.40
September	170.00
October	185.10
November	201.40
December	214.00
Total, yr.	2146.50



THE ELLIOTT KEROSENE STANDARD PHOTOMETER LAMP.

❋❋❋

10-Candle Power.

❋❋❋

This lamp is a perfect substitute for the 10-candle Pentane Lamp hitherto used, and has the following advantages:

1st. It uses Standard Kerosene Oil (Pratt's Astral Oil or equivalent).

2d. It is remarkably steady. Will burn 24 hours continuously with less than 2 per cent. variation.

3d. It is much less dangerous than Pentane, which is a kind of gasolene.

4th. It is not easily affected by air currents in the photometer room.

5th. Since the lamp may burn continuously, the candle power of gas may be taken at any moment, if necessary. This insures steady illuminating power without waste of carburetting material.

6th. The first cost of the lamp brings it within the reach of even small gas works.

7th. Costs much less to maintain than a Pentane lamp or sperm candles doing the same service.

8th. Is not affected by the weather.

PUBLIC LIGHTING TABLE.

SEPTEMBER, 1906.

Day of Week.	Date.	Table No. 2. NEW YORK CITY. All Night Lighting. Light	Extinguish.
		P. M.	A. M.
Sat.	1	6.30	4.20
Sun.	2	6.30	4.20
Mon.	3	6.15	4.30
Tue.	4	6.15	4.30
Wed.	5	6.15	4.20
Thu.	6	6.15	4.30
Fri.	7	6.15	4.30
Sat.	8	6.15	4.30
Sun.	9	6.15	4.30
Mon.	10	6.05	4.40
Tue.	11	6.05	4.40
Wed.	12	6.05	4.40
Thu.	13	6.05	4.40
Fri.	14	6.05	4.40
Sat.	15	6.05	4.40
Sun.	16	6.05	4.40
Mon.	17	5.55	4.50
Tue.	18	5.55	4.50
Wed.	19	5.55	4.50
Thu.	20	5.55	4.50
Fri.	21	5 55	4.50
Sat.	22	5.55	4.50
Sun.	23	5.55	4.50
Mon.	24	5.40	5.00
Tue.	25	5.40	5.00
Wed.	26	5.40	5.00
Thu.	27	5.40	5.00
Fri.	28	5.40	5.00
Sat.	29	5.40	5.00
Sun.	30	5.40	5.00

TOTAL HOURS DURING 1906.

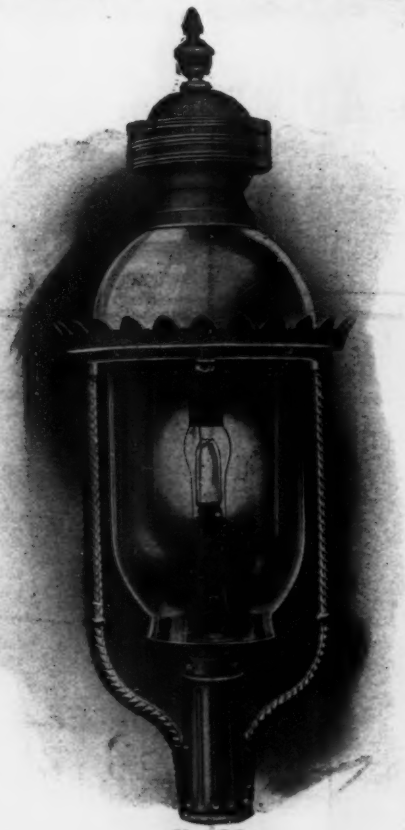
By Table No. 2.

	Hrs.Min.
January	423.20
February	355.25
March	355.35
April	298.50
May	264.50
June	234.25
July	243.45
August	280.25
September	321.15
October	374.30
November	401.40
December	433.45
Total, yr.	3987.45

NEW YORK, 318 West 42d Street. BOSTON, 220 Beacon Building. PHILADELPHIA, Broad and Arch Streets. ST. LOUIS, 712 Ree Building. CHICAGO, 218 La Salle Street. SAN FRANCISCO, 512 Oak Street.

WELSBACH STREET LIGHTING COMPANY

....OF AMERICA....



No. 36.

Controls and Operates the **Welsbach System of Street Lighting,**

Which includes its specially DESIGNED and PATENTED BURNER for PARK LIGHTING exclusively.

Uniformly SUCCESSFUL in 150 Cities and Towns.

By means of the Welsbach System of street lighting the superiority of GAS over electricity for street lighting has been fully demonstrated.

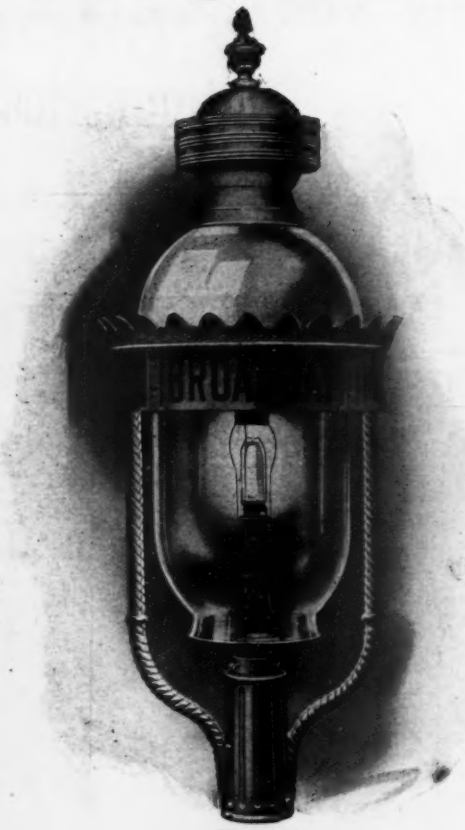
POINTS OF MERIT:

It is { Economical, Attractive, Successful, Up-to-date.

IT LIGHTS THE STREET.

Where there are no gas mains we can furnish an equally good light by our SELF-GENERATING NAPHTHA WELSBACH BURNER, and thereby supply a uniform light in all localities.

Correspondence Solicited from Gas Companies and Others interested in Municipal and Outside Lighting.



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THE NEW NO. 7 WELSBACH DINING ROOM FIXTURE.

PRICE, EACH, COMPLETE, WITH SHADE, FRINGE, MANTLE AND CHIMNEY, $14. PER DOZ., $150. DISCOUNT, 50 PER CT.

Standard Length, 30 inches.
The New No. 7 Welsbach Dining Room Fixture, when ordered, will be sent complete, as follows:

- 1 No. 7 Harp Fixture and Brass Crown finished in Brushed Brass.
- 1 No. 66 Welsbach Burner (high candle power).
- 1 No. 4 Pilot By-pass.
- 1 No. 4197 Mantle — Intensive Brand.
- 1 No. 306 Chimney (air hole).
- 1 Fourteen-inch GREEN Art Glass Shade, with six-inch Green Beaded Fringe.

VARIATIONS.

Finished in oxidized copper, oxidized brass, etc., 25 cents extra.

Shades in Ruby and Green--Ruby, Amber and other colors, without extra charge.

Special colors require a few days extra time to fill orders.

Green Shades will be shipped unless otherwise ordered.

This fixture is being largely used by Gas Companies as a dining room fixture at the popular retail price of $10 complete, and is a great favorite for moderate sized two and three-story residences. In popularity and price it is unequalled.

WELSBACH CO.,

Salesrooms in All the Principal Cities of the United States.

Factories:
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THE UNITED GAS IMPROVEMENT COMPANY

For the Six Months Ending July 1st, 1906, has been Awarded Contracts for 25 Sets of

Standard Double-Superheater Lowe Water Gas Apparatus.

PARTIAL LIST OF PLACES:

New Britain, Conn. (2d contract).	**Philadelphia, Pa.**	**Lewiston, Pa.**
Malden, Mass. (3d contract).	**Waterbury, Conn.**	**Greenville, Tex.**
Kirksville, Mo.	**Manchester, N. H.**	**New York,** Cent. Un. (3d contract).
St. Johnsbury, Vt.	**Allentown, Pa.**	**Jefferson City, Mo.**
Memphis, Tenn. (2d contract).	**Omaha, Neb.**	**Peekskill, N. Y.** (2d contract).
Council Bluffs, Ia. (2d contract).	**Muskegon, Mich.**	**Waterville, Me.**
Seattle, Wash. (2d contract).	**Nazareth, Pa.** (2d contract).	**Washington, D. C.** (3d contract).

TOTAL SETS TO JULY 1, 1906, = = = = = 618

TOTAL DAILY CAPACITY TO JULY 1, 1906, 488,930,000 CUBIC FEET.

The United Gas Improvement Company,

Broad and Arch Streets, Philadelphia.

Established 1858. Incorporated 1890.
CHAS. E. GREGORY, Prest. DAVID R. DALY, V.-Prest. & Treas.
H. D. ABERNETHY, Sec.

J. H. Gautier & Co.

Greene & Essex Streets,
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FIRE BRICK and FIRE CLAY SPECIALTIES.

Ground Fire Clay, Fire Sand and Ground Fire Brick in Barrels and Bulk.

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FLEMMING GENERATOR GAS FURNACE

Brooklyn Fire Brick Works,

OFFICE AND WORKS:
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DESIGNERS AND BUILDERS OF

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SPECIAL HIGH GRADE REFRACTORY MATERIAL FOR BENCH SETTINGS AND WATER GAS LININGS,

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For Students in Gas Manufacture.

ELEMENTARY, ADVANCED AND CONSTRUCTIONAL.

Three Volumes. Price, $1.50 each. For Sale by
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Manhattan Fire Brick and Enameled Fire Clay Retort Works.

Works at Weber, on the Raritan River. Middlesex County, New Jersey.

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Modern Coal Gas Benches,

With either Horizontal or Vertical Retorts, Half-Depth and Full-Depth Recuperative Furnaces.

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STANDARD BENCH IRONWORK.

Linings for Water Gas Apparatus, High Grade Fire Brick of All Shapes and Sizes, Ground Fire Clay, Ground Fire Brick in Bulk or in Barrels.

ISAAC C. BAXTER, President.
Works.
LOCKPORT STATION, PA.

ESTABLISHED 1864.

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Successor to WILLIAM GARDNER & SON.

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Fire Clay Goods for Gas Works.

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BALTIMORE RETORT & FIREBRICK CO.

BALTIMORE, MD.,

Manufacturers of all Material for the Construction of Coal Gas Benches.

HALF AND FULL DEPTH AND FREE FIRING BENCHES,

All styles of which we have in operation, equipped with the BEST of LATEST IMPROVEMENTS, proving our claim for SUPERIOR QUALITY and EFFICIENCY.

INCLINES—We have in SUCCESSFUL OPERATION benches of Inclined Retorts, MANUFACTURED and ERECTED by us.

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Agents for New England States.

LARGE FACILITIES—Correspondence Solicited.
RAIL and WATER CONNECTIONS to ALL POINTS.

NATIONAL PYROGRANIT COMPANY,

MANUFACTURERS OF

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Manufacturers of

High Grade Firebrick, Blocks, Tiles,

ETC.,

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A Cement of great value for patching retorts, putting on mouthpieces, making up all bench-work joints, lining blast furnaces and cupolas. This cement is mixed ready for use. Economic and thorough in its work. Fully warranted to stick.

Price List, f.o.b. PITTSBURGH, PA.
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In Kegs, 100 to 200 " " 6 " "
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An Analysis of the Principal Gas Undertakings in England, Scotland and Ireland. Being the 37th year of publication. Compiled and arranged by JOHN W. FIELD, Sec'y and Gen. Mgr. of The Gas Light and Coke Company, London. Price, $5. For Sale by
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JOHN DELL,
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ESTABLISHED 1882.

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We are the **Exclusive Agents** *for the* **Mitchell Patent Benches,** *Constructed with Half or Full Depth Furnaces, to Burn either Coal or Coke, and Arranged for Front or* **Rear Clinkering.** *The* **Mitchell** *is the* **Original Coal Firing Bench.** *We also Erect Plain Benches with* **One** *to* **Six Retorts.**

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Three-Scoop and Three-Rake Charging and Discharging Machines are operating in New York, Newark, N. J., Philadelphia, Worcester, Mass., Mt. Vernon, N. Y., Toronto and Montreal, Canada, Detroit, Seattle, Rochester and St. Louis.

Four-Scoop and Four-Rake Charging and Discharging Machines are operating in Detroit, Mich., and Cincinnati, Ohio. These are the only machines that will draw or charge simultaneously 3 or 4 retorts (vertically) and handle from 42 to 60 retorts in from 25 to 30 minutes, lid opening and closing and filling of furnaces included.

Hot Coke Conveyor, Quencher and Steam Exhauster, operating in Toronto, Canada, working in water-sealed flue, rollers being protected from heat and grit.

COAL CRUSHERS, CONVEYORS AND BINS. TURNTABLES FOR MACHINES.

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Contracting Engineer and Builder,

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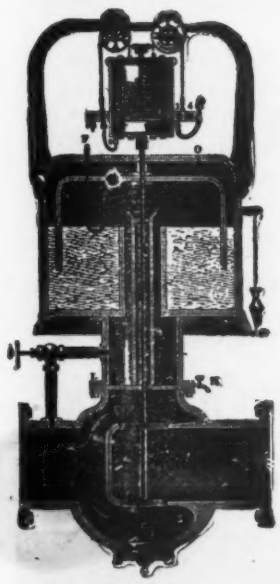

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COAL OR WATER GAS PLANTS,

Automatic, Balance, High Pressure and Service Governors,

Roots Improved Gas Exhausters,

Iron Sponge, Purifying Material for Gas Purification, Jones Jet Photometers, Pressure Registers, etc.,

INSTALLATION OF SMOKELESS TAR BURNING SYSTEM.

Reinforced Concrete Construction for all Purposes,

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WE MAKE A SPECIALTY OF WATER GAS LININGS AND CHECKER BRICK.

Half and Full Depth Benches of Our Own Design, Containing 6, 8 or 9 Retorts.

SLOPERS.—We have perfected plans of INCLINED RETORT BENCHES, designed to meet conditions prevailing in America, and constructed entirely of American materials.

We Build Benches Complete. Ready for Gas Making. Also,

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COAL and COKE CONVEYING MACHINERY.

Plans, Specifications and Estimates Cheerfully Furnished.

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ALL CONTRACTS MADE AS OF ST. LOUIS, MO.

Gold Medals awarded by the Louisiana Purchase Exposition at St. Louis, for fireclay gas retorts, gas retort benches, firebrick and setting tiles

Newbigging's Handbook for Gas Engineers and Managers.

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Old Kentucky Shale and O. K. Boghead.

SHIPMENTS FROM NEW YORK, PHILADELPHIA, BALTIMORE AND NORFOLK.

BERWIND-WHITE COAL MINING COMPANY'S

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STRICTLY High Grade. . . . .
Carefully Prepared.
For Gas Making or
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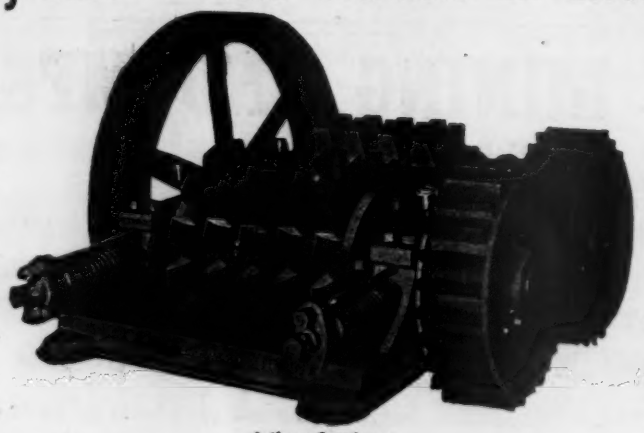
Screens.

Chains.

Wheels.

Dump Cars.

Send for Catalogue.



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Elevator Buckets.

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Chain Conveyors.

Our Prices will Interest you.

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THE CALORIFIC POWER OF FUELS.

By HERMAN POOLE, F.C.S.

Second Edition. Price, $3. For Sale by
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ENGINEERS AND BUILDERS OF GAS PLANTS.

Inclined Benches, own system, Recuperative Furnaces, Exhausters, Exhauster Governors, Condensers, Washers, Coolers, Wet Purifying Plants, Purifiers, Oxide Elevators, Hydraulic and Dry Coke Conveyors.

Special High Grade Material for Recuperative Furnaces.

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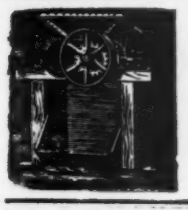

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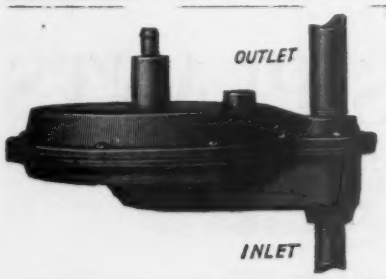

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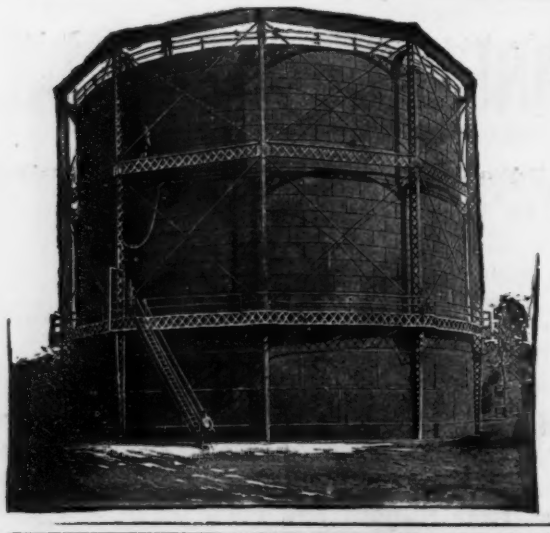

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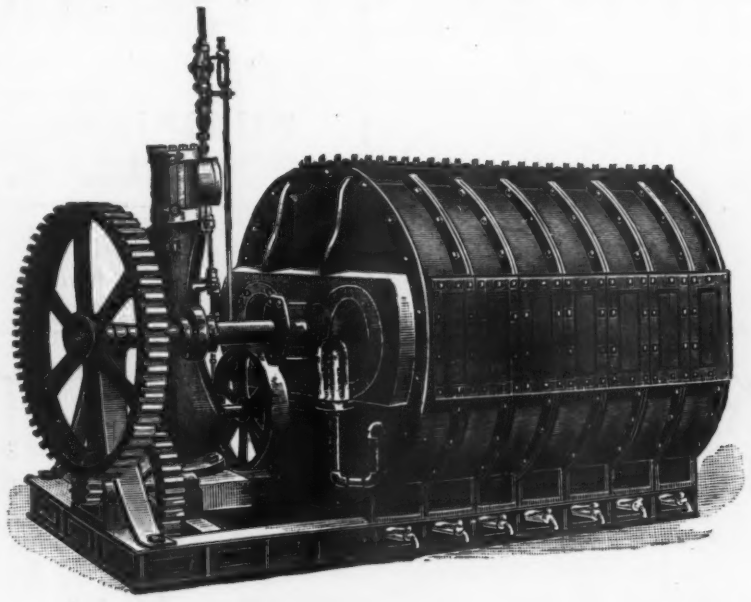

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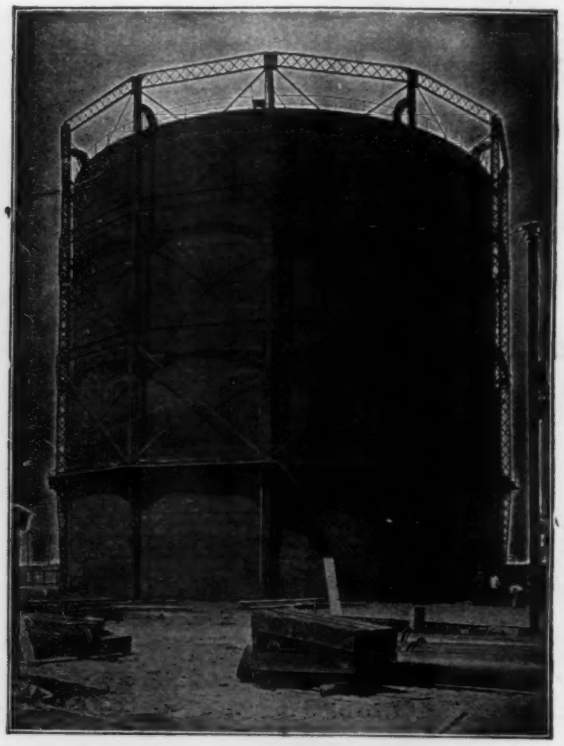

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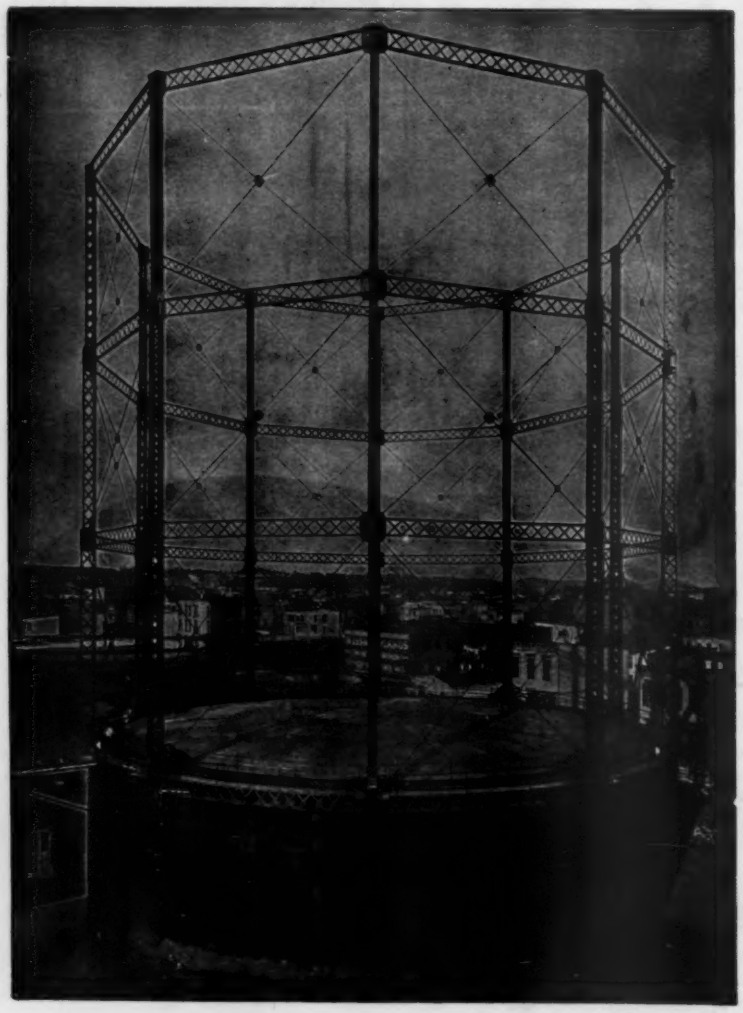

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